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AN

AUTOBIOGRAPHY

BY

HERBERT SPENCER

VOL. I.

WILLIAMS AND NORGATE
HENRIETTA STREET, COVENT GARDEN, LONDON
1904
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NOTE BY THE TRUSTEES.

THIS Autobiography is published as it was left by Mr. Spencer, with a few modifications, the most important of which relates to the division of the volumes. It was Mr. Spencer's original intention that the first volume should end with Chapter XXIII. His reason was thus stated in a letter to his American publishers: "The first volume ends my engineering and miscellaneous life, and the second volume begins my literary life." This, he said, was a "natural division." But, in order to obviate the very great inequality in thickness that would have thus existed between the two volumes, we, his Trustees, in the exercise of our discretion, have ventured to adopt another "natural division," making the first volume end with the termination of his miscellaneous work and the second volume begin with the planning of the Synthetic Philosophy.

The illustrations for Part I having been of somewhat inferior execution, improved blocks have been prepared, from which the portraits have been printed. A sentence on page 104 of the first volume, referring to a photograph of Hinton Parsonage, taken from a drawing made by Mr. Spencer when a boy, has been omitted because the photograph could not be found. Some renumbering of Parts and Chapters, re-paragraphing, and a few necessary verbal corrections are the only other changes that have been made.

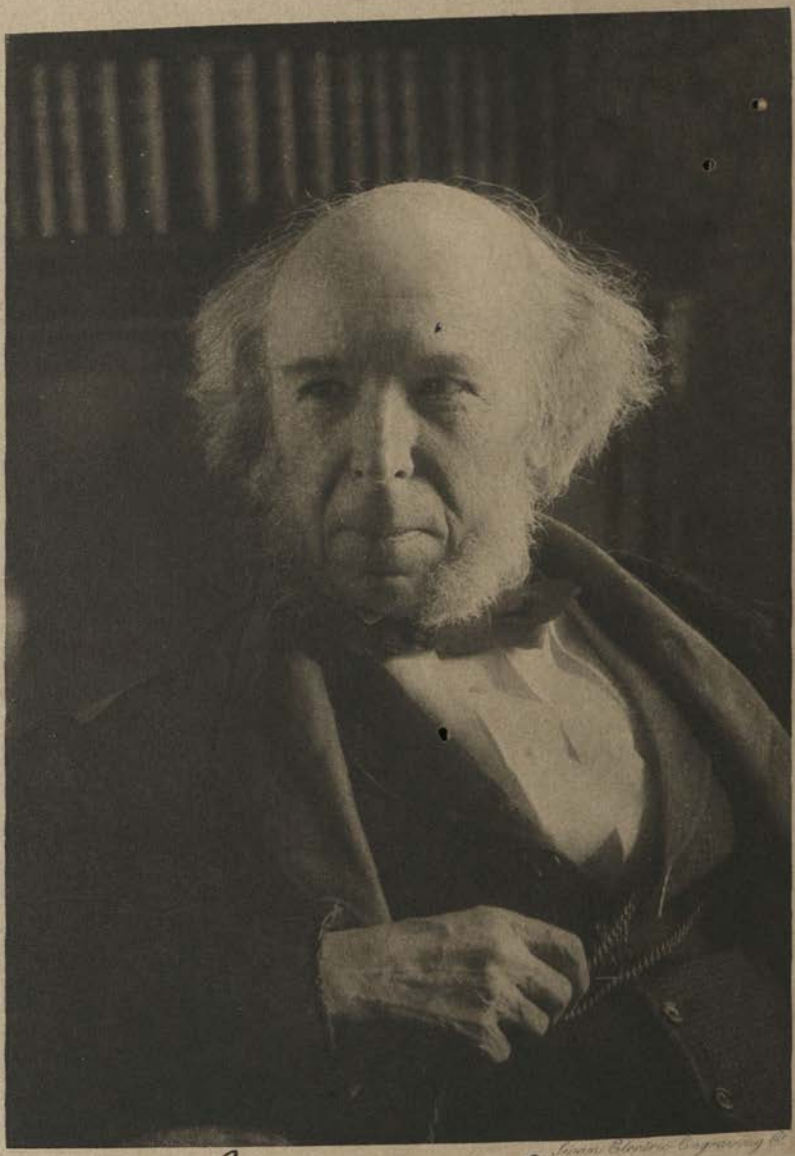
The statement made in Vol. II, page 98, as to the terms under which Mr. Spencer's works were published in America, was probably written about 1886. Later, both before the coming into force of the International Copyright Act of 1892 and after that date, an alteration in the terms mentioned was made. When a book was manufactured in the United States the royalty paid by Messrs. Appleton was 10 per cent. instead of 15 per cent. It is, however, well worthy of note that over a long series of years, from 1860 onwards, a royalty payment was made by Messrs. Appleton to Mr. Spencer although he had no legal protection for his writings in the United States.

AUBERON HERBERT.
H. CHARLTON BASTIAN.
DAVID DUNCAN.

I feel, in signing this note drawn up by my co-trustees, upon whom the whole trouble of making the arrangements has fallen—a trouble in which I have not been able to share owing to my absence in Egypt—that personally I should have been in favour of dividing the volume, which is over-large, into two parts, and thus conforming more nearly to Mr. Spencer's wish. But at the same time I feel that my colleagues know all the circumstances of the case, both past and present, far better than I know them; and I am quite ready to believe that they may have judged more truly than myself, as regards what Mr. Spencer would have wished in the matter. I regret very much the additional trouble that my absence has entailed on them.

Post Office, Cairo,
March 3, 1904.

AUBERON HERBERT.



Herbert Spencer
when 78

PREFACE.

IT has seemed to me that a natural history of myself would be a useful accompaniment to the books which it has been the chief occupation of my life to write. In the following chapters I have attempted to give such a natural history. That I have fully succeeded is not to be supposed; but perhaps I have succeeded partially. At any rate, one significant truth has been made clear—that in the genesis of a system of thought the emotional nature is a large factor: perhaps as large a factor as the intellectual nature.

Some peculiarities in the instruction given to me ought not to pass without remark. That neither in boyhood nor youth did I receive a single lesson in English, and that I have remained entirely without formal knowledge of syntax down to the present hour, are facts which should be known; since their implications are at variance with assumptions universally accepted. And there should be noted other large omissions, as well as considerable additions, which gave to my education a character unlike that of the ordinary education.

Further, some advantage is likely to result from presenting in their order of genesis the evolutionary ideas set forth in my works; beginning with certain vague adumbrations of them dating back to 1842 and 1844, passing on to the definite germs which made their appearance in

1850, and showing the successive stages through which the developed form of the Doctrine of Evolution was reached in 1869. Apart from such interest as this piece of mental history has, the delineation of it will, perhaps, yield aids to the readers of *The Synthetic Philosophy*. The ultimate product may be rendered more comprehensible by contemplation of its growth.

Before proceeding with this volume, the reader should glance at the note prefixed to the second volume. After learning from it how irregular has been the order in which the different parts of the work have been written, he will not be surprised by certain small repetitions, and possibly other anomalies, with which he will meet.

H. S.

64, Avenue Road,
Regent's Park, London,
27th April, 1894.

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PART I

CHAPTER I.

EXTRACTION.

Most persons recognize the vanity of genealogies which, singling out one ancestor, perhaps quite remote, ignore all those other ancestors—8, 16, 32, 64, according to the distance back—whose shares in forefatherhood are equally great. But there are genealogies for which something is to be said. Among men, as among inferior creatures, there occasionally arise individual constitutions of great persistence, which impress themselves on many generations of posterity; and in such cases a statement of extraction may not be uninstructive. Other cases there are in which, though many generations may be traced, not the traits of some one marked individual, but family-traits which have been common to several lines of ancestry, and have hence become well-established in descendants common to them all. In my own case there are certain ancestral traits of this kind which are not without significance. Those ancestors concerning whom not much is to be said, may first be named.

I know little about the line of my grandmother on the paternal side, further than that the family, named Taylor, was of the lower middle class, and was resident in Derby.

Nor have I anything definite to say respecting the extraction of my mother's father, whose name was Holmes—a name which may have had a topographical origin, for there is, or was, a tract of pasture bordering the Derwent, called

"the Holmes." But there seems some probability of a connexion which I have been unable to establish. In a diary kept by my mother during her girlhood, there are mentions of visits to the Holmeses of Brailsford, a village eight miles from Derby. These Holmeses seem to have been, and are still, small landowners, farming their own land. Inquiries made some dozen years ago failed to show any relationship. Yet it seems unlikely that there should have been interchanges of visits between families residing near one another and of the same name, who were unrelated.

Probably I might have gathered more about these lives of ancestors had I in early life been curious in such matters. Or had our family been prone to gossip, some knowledge of bygone Taylors and Holmeses might have been unawares conveyed to me.

A good deal may be set down concerning the line of my maternal grandmother. The name was Brettell—a name which I find otherwise spelt Brettyl, Brethull, Brettal, Brettle, Brittle. In the *Herald and Genealogist*, vol. I, pp. 421–6, Mr. Sidney Grazebrook, himself a descendant of the family, gives some acccount of it: having first indicated the foreign origin of neighbours named Henzey, with whom the Brettells intermarried.

"Towards the end of the 16th century Thomas and Balthazar de Hennezel [naturalized Henzey], dwelling near the Vosges in Lorraine, with their near relatives Tyttery and Tyzach, all Huguenots . . . emigrated to this country," and some of them settled in "the neighbourhood of Stourbridge." * * *

"The genealogy of the Henzey, or de Hennezel, family is given in De la Chenaye Desbois, in his *Dictionnaire de la Noblesse*, from which it appears that it was of noble Bohemian origin." * * *

"Ananias Henzell (naturalized Henzey) 'de la maison de Henzel, tout pré la village de Darnell en la pie de Lorraine' born in 1570" had a son Joshua who married a Joan Brettell.

Concerning the Brettells he goes on to say:—

"This family would also appear to be of French descent. Indeed it is traditionally derived from the de Breteuils, of Normandy. But

it was established in the neighbourhood of Stourbridge (where now the name is extremely common) at the commencement of the 16th century, if not earlier. [It was there in the time of Henry VI.]

"In the year 1617 John Brettell and Mary Henzeye were married at Oldswinford, and it has been seen that Joshua Henzey married a lady of the same name. These intermarriages would almost lead one to imagine that the Brettells were also refugees; yet the year we find Roger at Bromsley was prior to any of the great persecutions."

"There are two distinct families of Brettell in this neighbourhood, no doubt of common origin, but not known to be related: the Brettells of Dudley and Brettell Lane and that of which I am about to treat."*

The family of which Mr. Grazebrook then proceeds to treat is, by implication, that which was located in Oldswinford parish, or otherwise in the better known place, Stourbridge, which has grown up within it. The Oldswinford register records the marriage of Joshua Henzell with Joan Brettell, and, as above implied, the register also shows the marriage of John Brettell with Mary Henzey in 1617. Further, about 1740, there was a marriage of Thomas Brettell to Sarah Henzey, as shown by the registry of their son's birth shortly after; and then, on June 15, 1740, is registered the marriage of Joseph and Elizabeth Brettell, my great-grandfather and great-grandmother: Joseph and Thomas being not improbably brothers. The question is—Were these Brettells who married in 1740 descendants of the John Brettell and Mary Henzeye who married in 1617? From the fact that in the reign of Elizabeth Oldswinford contained a hundred families, we may infer that in 1617 its population was not more than 600; and it is a reasonable estimate that between that time and 1740, it did not increase to more than 2000: the

* That these two names are of foreign derivation, is a conclusion confirmed by the fact that they have undergone on the Continent contractions like those which they have undergone here. The name Bretel now exists in Normandy; and in Switzerland, as well as in France, the name Henzi is found. Curiously enough, the first of the two is used to distinguish railway-stations both in France and England. There is a station at Breteuil on the Northern of France; and there is the Brettell-Lane station between Dudley and Stourbridge.

growth of its numbers up to 5000 at the beginning of this century being doubtless mainly due to its manufacturing activity. But in a place with a population growing during 120 years from 600 to 2000 there could hardly have been more than one clan of Brettells. Hence the inference that Joseph Brettell, living in the 18th century, was a descendant of John Brettell living in the 17th century, becomes very probable. If this inference be accepted, then it follows that my great-grandfather and his children inherited from the Henzeys a dash of Huguenot blood. A further inference may be drawn as not improbable. In the French genealogical dictionary above quoted, published in the middle of this century, it is stated that these de Hennezels, coming from Bohemia, had been settled in Lorraine about four centuries. This takes us back to the middle of the 15th century. Now the Hussite wars lasted from about 1420 to 1436, and the persecutions, doubtless continued after the subjugation of the Hussites, were such that the movement had ended soon after 1450. Is it not then highly probable that these de Hennezels, who came from Bohemia about 1450, were refugee Hussites? In the absence of another natural cause for their migration into Lorraine at that date, we may rationally assume that sectarian animosity was the cause. If so, it follows that in one line of ancestors of these Brettells, there have twice been resistances to religious authority, and flight in preference to submission.*

* In the course of these genealogical inquiries I discovered that my great-grandmother's maiden surname was Hemus. The name struck me as odd, and decidedly un-English: prompting me to make inquiries respecting its existence elsewhere. Examination proved that it is not to be found in the London Directory; and as, in so large a city, recruited from all parts of the kingdom, the name does not occur, its scarcity is manifest. Its turns out, however, that there are persons of the name in Birmingham, which is but 12 miles from Stourbridge: a fact congruous with the supposition that Stourbridge was its centre of diffusion. Hence there arose a suspicion that in this group of Huguenot immigrants, Hennezel, Tyttery and Tyzack, there may have been another named Hemus. From Mr. Joseph Ülehla, who

If any ingrained nonconformity of nature is to be hence inferred, it may have gone some way to account for that nonconformity which, however derived, was displayed by the children of my great-grandfather Brettell. For, apart from this probable genealogy, there stands the significant fact that out of a family of seven, five were among the earliest Wesleyans (of whom my maternal grandmother was one), and two of these were among the earliest Wesleyan preachers—John Brettell and Jeremiah Brettell, born respectively in 1742 and 1753. Of these the younger, Jeremiah, seems to have been somewhat intimately associated with John Wesley, who spoke approvingly of his work; and at one time he was appointed to the Upworth circuit: Upworth being Wesley's native

translated one of my works into the Bohemian language, I gather that there exist names allied to it in Bohemia. The one approaching most closely is Hemiš (pronounced Hemish). Now between Hemiš and Hemus there is a divergence much smaller than many familiar divergences in names; and hence it is a reasonable supposition that Hemus was in Bohemian Hemiš. But why Bohemian? Well, if one of the Hussite refugees who fled with the rest into Lorraine, was named Hemiš, and if one of the Huguenot refugees who, during the later religious persecutions, migrated to England was a descendant of his, who joined the other descendants of the Hussites, then it seems possible, or even probable, that this great-grandmother Hemus had a genealogy in this respect like the others.

Further inquiries, made since the above paragraph was put in type, have yielded verifying evidence. One of the six Hemuses residing in Birmingham says all the others are his cousins or second cousins, and further says that his father was a farmer at Hanbury near Droitwich, which is but 13 miles from Stourbridge. Seven of the names are in the Worcestershire Directory, and to my questions one of these has referred to a cousin in Birmingham, while another says that all the Worcestershire Hemuses seem to be connected, and that until lately the name was limited to the county: facts implying recent divergence from a common root. But perhaps the most significant discovery is that one member of the family possesses an ancient sword (or hunting-knife thirty inches long) on the blade of which is engraved one of the hunting rhymes "much used by the Germans," says a German professor, who also says that weapons of the kind "were much used in the forests of Bohemia and Germany." The vicar of Stoulton, where one branch of the family has lived since 1748, says of a recently deceased "Farmer" Hemus that "he used to say ''Ch oonder,' for 'I wonder,' a very interesting survival in modern days of the old ic = ich = I."

place. Of John Brettell there exists, in the *Arminian Magazine* for 1796, a brief biography written by his brother; and there is a portrait of him in the same periodical for March 1784. Jeremiah, of whom there is a portrait in the *Arminian Magazine* for February 1784, and another in the *Wesleyan Methodist Magazine* for August 1823, and a third in the *Methodist Magazine* about 1796, wrote a memoir of himself, which was published after his death in the *Wesleyan Methodist Magazine* for October 1830.

As in those days, when Wesley and his followers were persecuted, it required both pronounced convictions and considerable courage to dissent from the established creed, and disregard the authority upholding it, there must have been in these two men more than usual individuality of character.*

Concerning the genealogy of the Spencers, the question of chief interest is whether any connexion exists between the Spencers of Derbyshire and the Spencers of Northamptonshire; for, of course, were there proof of common origin with the poet, I should gladly give it. But, so far as I know, there is no such proof. The spelling of the name presents no bar to the supposition of kinship; for, in early day, modes of spelling were unsettled. Of this, curious proof is afforded in the present case on tracing

* Further evidence of constitutional nonconformity among members of the Brettell clan, is worth adding. In the account of the Wesleyan preacher, John Brettell, given in the *Arminian Magazine* for 1796 by his brother, it is said that he was "converted by a local preacher named Brettell." If we infer, as before, that there was probably but one clan of Brettells in Stourbridge, it seems most likely that this Brettell was a distant relative—a common descendant of the John Brettell who married a Henzey in 1617. Another example exists. In the *Dictionary of National Biography* there is an account of a Jacob Brettell, a Unitarian minister, who died in 1862, whose father, Jacob Brettell, having first become, at the age of 17, a Calvinistic preacher, afterwards became an Independent minister, and ultimately renouncing Calvinism, opened a separate meeting-house. His father —that is the grandfather of the first named—was an Independent minister at Wolverhampton, which is only ten miles from Stourbridge.

back the Spencer-ancestry to the middle of the 17th century. At that time, apparently by a clerical error (probably in a double sense), the spelling of the name was changed in the register of baptisms of the same family: the father's name being spelt with an *s* in the entry of the baptism of his son Anthony in 1657, and with a *c* in the entry of the baptism of his son William in 1659. The spelling with a *c* was thereafter uniformly used.

The name Spencer is by no means uncommon in North Derbyshire, and is prevalent in the neighbourhood of Wirksworth. Indeed, in the village of Middleton-by-Wirksworth it occurs so often that, when passing through the place years ago, I observed that out of the shop-signs the majority bore the name Spencer. Among places in which the name is of long standing is Kirk-Ireton, about three miles to the south-west of Wirksworth—a secluded village seated high, and just where the undulating portion of Derbyshire begins to pass into the more mountainous portion. Here our family had been settled for generations. A series of extracts from the parish-register, which I obtained some 20 years ago from the rector, shows that the name existed there in the latter part of the 16th century, if not earlier. On tracing back the entries, it appears that my grandfather, Mathew Spencer, was born there in 1762; that my great-grandfather, Mathew, was born there in 1735; that my great-great-grandfather, William, was born there in 1702; and that my great-great-great-grandfather, William, was born there in 1675. Before this date the line of descent is not traceable, because the entries extending over a period of more than 50 years after 1600, have been rendered illegible by damp. Next preceding that period comes the name of Anthony Spencer, baptized in 1597, and then a little before that comes the earliest legible registry of the name, in the marriage of Thomas Spencer with Agnes Heane, in 1581.

The oldest family document which has been preserved

is a deed of settlement by my great-grandfather when he was about to marry Elizabeth Soar, who is, in the deed, represented as having "expectations." Most likely it was the desire that there should be an equivalent to these expectations which led to the tying up of a small property, consisting of two fields and four cottages, by my great-grandfather. It would seem, however, that Elizabeth Soar's expectations were disappointed, for there is no sign that any increase of possessions accrued to the family from the marriage. The next oldest document I possess, is a letter written by this great-grandmother, Elizabeth Spencer, to her son, my grandfather, asking him to send an easy vehicle to convey her to Derby, that she might take up her abode with him: her widowed life at Kirk-Ireton having become wearisome in her old age.

Of these village-ancestors, two traits may be noted—one inferred and the other known. The dates of their marriages imply that the Kirk-Ireton Spencers were a prudent race.

Beginning with Anthony Spencer, the remotest identifiable ancestor whose birth is registered, we find that the interval between his birth and that of his grandson (the date of his son's being lost in the illegible part of the register) is 60 years. Unless there were three generations, each following its predecessor at an interval of 20 years, which is very improbable, the son and grandson must have respectively married at the average age of nearly 30. My great-great-great-grandfather appears to have been 26 when he married. My great-great-grandfather did not marry till he was over 30. Again, 26 was the age my great-grandfather had reached before he undertook domestic responsibilities. And like caution was shown by my grandfather.

A more pronounced manifestation of prudential feeling was habitually given by my great-grandmother, Elizabeth

During their boyhood, her grandsons from time to time made visits to Kirk-Ireton, and my father told me that always when he came away the last words of his grandmother took the form of a message to her daughter-in-law Catherine—"Be sure you tell Kitty to forecast." So unusual an injunction, repeatedly given, seems to imply a very predominant tendency to consider the future rather than the present.

As said at the outset, facts of lineage may have significance where there are pronounced family-traits, and especially where these traits are manifested along both lines of ancestry. This seems to be the case here.

The nonconforming tendency—the lack of regard for certain of the established authorities, and readiness to dissent from accepted opinions—of course characterized, in considerable degrees, the earliest of Wesley's followers; and, like the Brettell family, the Spencer family, the Holmes family, and the Taylor family, were among these earliest followers. Beyond the relative independence of nature thus displayed, there was implied a correlative dependence on something higher than legislative enactments. Under circumstances indicated by the bearing of persecution for religious beliefs, nonconformity to human authority implies conformity to something regarded as higher than human authority. And this conformity is of the same intrinsic nature whether it be shown towards a conceived personal Deity, or whether it be shown towards a Power transcending conception whence the established order proceeds—whether the rule of life is derived from supposed divine *dicta* or whether it is derived from ascertained natural principles. In either case there is obedience to regulations, upheld as superior to the regulations made by men.

A further trait common to the two lines of forefathers is regard for remote results rather than for immediate results. Relinquishment of present satisfactions with

the view of obtaining future satisfactions, is shown alike in that prudence which by self-denial seeks terrestial welfare and by that prudence which by self-denial seeks celestial welfare. In both cases, proximate gratifications which are seen to be relatively small are sacrificed to future gratifications which are conceived as relatively great. In the family-traits above described were visible both these aspects of the self-restraining nature. The elder Brettells, described by their son Jeremiah as moral and church-going people, gave such indications of this character as well-conducted life implies; and the Wesleyans among their children, displayed it in the form of preference for the promised happiness of a life hereafter to various pleasures of the present life. Exhibiting the same trait in their creed and corresponding conduct, the Spencers exhibited it in other ways. The relatively late marriages indicated, and still more that emphatic advice to forecast, imply that the readiness to sacrifice the passing day for days to come was a family-characteristic. And this was recognized by some members of the last generation; for I remember in a letter of one uncle to another, a failing which they were said to have in common, was described as a tendency to dwell too much upon possible forthcoming evils.

Has there not been inheritance of these ancestral traits, or some of them? That the spirit of nonconformity is shown by me in various directions, no one can deny: the disregard of authority, political, religious, or social, is very conspicuous. Along with this there goes, in a transfigured form, a placing of principles having superhuman origins above rules having human origins; for throughout all writings of mine relating to the affairs of men, it is contended that ethical injunctions stand above legal injunctions. And once more, there is everywhere shown in my discussions of political questions, a contemplation of remote results rather than immediate results, joined with

an insistence on the importance of the first as compared with that of the last.

These analogies are so clear that it can scarcely, I think, be fancy on my part to regard them as implying a descent of family-characteristics.

CHAPTER II.

GRANDPARENTS AND THEIR CHILDREN.

PURSUING the same course as before, I will here describe first those members of the grandparental group about whom there is least to be said. For this reason I commence with my mother's parents.

Of John Holmes, my maternal grandfather, the earliest record I have is an indenture of apprenticeship to John Evatt, a plumber and glazier in Derby, dated 1765, which identifies him as the son of Frances Holmes, widow, of the same place: the probability being that his deceased father had left wife and child with but narrow means. Save the possible relationship before named, to the Holmeses of Brailsford, this is all I know of his antecedents.

I infer that he succeeded to Mr. Evatt's business. At any rate he carried on with success the specified trade for many years, and became a prosperous man. This is shown by the fact that when my mother was 20 (in 1814) he had a suburban house in addition to his place of business. Soon after, however, he illustrated the truth that men who are prudent in small matters are apt to commit extreme imprudences in large matters: their caution having prevented them from gaining those experiences which lead to knowledge of dangers. He was induced to enter into partnership with a man named Aucott, as a pin-manufacturer; and he supplied most, if

not the whole, of the capital. The enterprise was a failure and he lost nearly all his property: partly through non-success of the business and partly by becoming security for his partner. The result was that the latter part of his life was spent in narrow circumstances; and after my grandmother's death his last years were passed in our house.

In common with all members of both families in that generation, he was a Wesleyan, and an active member of the connexion in Derby. From my mother's diary, kept during her teens, it appears that the Wesleyan preachers were frequently entertained at his house, and he was himself "a local preacher." We may not suppose that the ability to preach such sermons as served for rural congregations round about Derby, was an indication of any ability calling for mention; and I remember my father speaking of him as "a slow coach." Nevertheless, he appears to have had a little more than the ordinary amount of faculty. Among my mother's letters are some verses addressed by him to her when she was away on a visit, urging her to return. Taking the familiar shape of a parody, and substituting "My Harriet" for "My Mother," they diverge a good deal in idea from their prototype; and, being fairly good in rhyme and rhythm, as well as in choice of words, exhibit some small power of literary expression.

I saw much of him during my early boyhood, when he had partially lost his faculties and wandered a good deal—wandered in a double sense, for his failure of memory took the form of supposing that he had matters of business to look after, and led to rambles through the town with a vain desire to fulfil them. Joined with the remembrance of this goes the remembrance of his peculiar walk—a walk which seemed about to break into a run, as though he were hurried. Eagerness in the fulfilment of duty survived even after mental decay had gone far.

Of my maternal grandmother, *née* Jane Brettell, there is

not much to be said. A portrait of her which I annex probably flatters her unduly, for I remember my mother said that it was not a good likeness. As, however, she must have been something like 50 before my mother's recollections of her became distinct, her appearance had doubtless diverged a good deal from that which she presented in her early days. That she had, however, some attractions, mentally or bodily or both, is shown by verses addressed to her, and signed Sarah Crole, expressed in the high-flown style of eulogy common in those days. They were written in Richmond, Virginia, to which place, some time after 1780, Jane went to take charge of the house of a "Carter Braxton, Esq." to whose care is addressed a letter from her brother Jeremiah, dated at the beginning of 1787. From an expression in the letter accompanying the verses I have named, it seems that Sarah Crole was a governess, and that the verses were addressed to my grandmother on her departure for England in July, 1788. The marriage to my grandfather must have been rather late. Her birth being in 1751 and her return from America being in 1788, she must have been something like 40. My mother, born in 1794, was the only child.

Such evidence as there is implies that this maternal grandmother was a commonplace person. Indeed, my father described her as vulgar-minded. His estimate was doubtless influenced by her persistent opposition to his marriage with my mother: an opposition founded, as it seems, on worldly considerations. That she took a purely mercantile view of marriage, I find further evidence in a letter to her from a nephew—John Bromley, a London auctioneer—expostulating with her upon this opposition, and implying that she ignored altogether the sentimental element in the relation. Perhaps, however, this was not then so decided an evidence of character as it would be now; for in those days there still survived the ideas and

usages which subordinated the wills of children to the wills of parents, in the choice of husbands or wives, and made motives of policy the exclusive, or almost exclusive, determinants.

In justice to her I should add that her disapproval of the marriage was in part prompted by the belief that her daughter would be too much subordinated; and in this she [illegible]ed to be right.

tolerably distinct image of my grandfather Spencer ins with me. It is the image of a melancholy-looking nan, sitting by the fireside, rarely saying anything, arely showing any sign of pleasure. The only smiles r saw on his face occurred when he patted me on the head ig my childhood. When, some 40 years ago, inquiries pted a reference to Dr. Biber's *Life of Pestalozzi*, is struck by the resemblance between Pestalozzi's and my grandfather's, or rather between the essions of the two faces; for my grandfather had ntly been a handsomer man than Pestalozzi. But both had the same worn and sad look. Not improbably ious fears had something to do with his chronic ncholy; or perhaps these merely gave a definite to the depression caused by constitutional exhaus-

His mature life had been passed during war time, taxes were heavy and the necessaries of life dear; the rearing of a large family on the proceeds of a ol, augmented to but a small extent by the returns from ittle property at Kirk-Ireton, had been a heavy burden him.

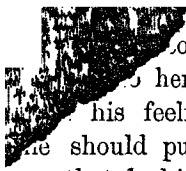
aving the Derby Grammar School out of the com-on, his school was about the best in the place. In arly days I remember hearing sundry leading men he town speak of having been his pupils. But in ion to teaching his own school, he played the part of ster at the Grammar School. He was not a classical

master, but he undertook the commercial division of the education given there. As one of the masters he had some of the Grammar-School boys as boarders, and from his account book I see that one of them was a son of Mr. Nightingale of Leahurst: not, however, an ancestor of Miss Nightingale, for the present Nightingales assumed the name on the property coming to them. This must have been before increase of his own family filled available space in his house.

There was no decided mark of intellectual superiorit him. He must have been a teacher entirely of the kind—a mechanical teacher. Nor does he seem to had any intellectual ambition or appreciation of intelle culture. So far from encouraging my father in st lying beyond or above the routine work of teachin spoke disapprovingly of them: wondering how my fa could waste time over them. If he possessed me faculty above the average, it must have been latent must have been rendered dormant by the labours of hard life.

But if nothing in the way of intellectual superiority be ascribed to him, there may be ascribed a marked n superiority. He was extremely tender-hearted—so n so that if, when a newspaper was being read aloud, t came an account of something cruel or very unjust would exclaim—"Stop, stop, I can't bear it." His pathetic nature was well shown, too, by his con towards a Derbyshire notable of those days—an eccen man named John Hallam, of whom some account is g in Robinson's *Derbyshire*. As I gathered from the rem dropped concerning John Hallam by my father uncles, he was one of the few men who have attem to carry out Christian ethics with literalness. That unusual character produced a great impression in locality, is shown by the fact that there exists a me tint portrait of him, and is further shown by a pa

THOMAS SPENCER



er from my Aunt Mary to my father. onversation with some pedlar who had her by John Hallam, she said that the man his feeling by saying that when John Hallam e should put on his worst clothes: meaning, as it ears, that lacking other means of going into mourning, should mourn in that way (a curious reversion to a itive form). My grandfather so far sympathized with John Hallam and his eccentricities, that he invited him ake up his abode at No. 4, Green Lane (my grand- 's house) whenever his wanderings brought him to y.

as nearly 11 at the time of my grandfather's death e age of 69, and I have a vague impression of having l that he was found dead on his knees.

y paternal grandmother, Catherine Spencer, *née* Taylor, of good type both physically and morally. Born in and marrying in 1786, when nearly 28, she had eight ren, led a very active life, and lived till 1843: dying e age of 84 in possession of all her faculties. Her titutional strength was shown by the fact that some ng of hers which I possess was written at the age of ithout spectacles.

ke her husband she was a follower of John Wesley. knew him personally, and was among the few who hed themselves to him in the days when he was ed by the populace. At the time of her death she was oldest member of the Wesleyan connexion in Derby.

f her original appearance there exists no evidence. her face in old age the annexed portrait gives a fair . The drawing is after a pencil sketch I made of in 1841, when she was in her 83rd year. This sketch ws her as wearing the plain Methodist cap, which she ered to all through life: this being a part of that olly unornamented dress which, in the early days of

Methodism, was, I think, *de rigueur*—a p
with Quakerism.

Nothing was specially manifest in her,
considered, unless, indeed, what would be calle
common sense. But of her superior emotional n
the proofs were marked. Unwearying, compassiona
good-tempered, conscientious, and affectionate, she had
the domestic virtues in large measures. How far this
due to her strong religious feeling, and how far to origi
character, I am not prepared to say. No doubt the
factors co-operated; but, in the absence of high
endowments, no religious feeling would have suffic
produce the traits she displayed. There are two wa
which a superior creed may act. Either the subor
tion-element in it may impress, and there may be g
observance of prescribed usages, an habitual expres
of reverence, manifestations of fear and obedience,
there may be more especially operative the ethical ele
associated with the creed. In the case of both
grandparents, while the subordination-element w
Christianity involves was duly recognized, the et
element, revived as it was in Wesleyanism, was
especially appreciated. Their innate tendencies
mainly the causes of their high moral manifestat
while, no doubt, these innate tendencies were strengthe
by the religious sanction. From an account of my gr
mother written by my uncle Thomas, of which I po
a copy in my father's hand, I quote the most signifi
passages:—

"I do not recollect ever seeing her give way to undue ange
violence of temper. I never knew her guilty of the slightest de
tion from integrity. I never knew her speak of any person
bitterness or ill-will. She was full of compassion for the afflicted
the destitute, and her feelings towards the ignorant and depra
were those of pity and not of contempt . . . . Her activity
so uniform, that I do not recollect even the appearance of indole
Her fault, if any, was in doing too much. She never spared her o

ld in any way minister to the comfort of my father
mily. In this respect she was the most unselfish
ver seen. She was particularly attentive to the per-
her religious duties . . . . Next to the Scriptures,
rite books were Fletcher's Letters, Baxter's Saint's Rest and
's Thomas à Kempis. The latter she always carried about her
." . . . .

is an obituary notice of her in the *Wesleyan Methodist ine* for January, 1844.

nily-traits are of course likely to be displayed in lines of descent, as well as in the particular line inquiry; and the identification of such traits may cilitated by comparing the various lines and observing they have in common. Hence it becomes desirable e some account not of grandparents and parents but of the other children of grandparents. Here, ore, I shall devote some space to sketches of my 's brothers and sister.

hing, of course, is to be said of the two who died in y. Of the six remaining, the first in order of age the only surviving daughter, Mary Ann Spencer, in August, 1788. I have but few data for a descrip- of her; and what description I can give is not larly favourable. She was living during my early d, and I remember her as a bedridden invalid, orn and fretful—a mere wreck, apparently, of one had originally been well-grown and fine-looking. pinion of my father was that a disappointed attach- had originated the invalid life which ended in this able way; and it may be that the unamiable mood tually displayed originated from the disappointment. judging from her letters written in youthful days, it s to me that she had a strong sense of her own claims not a duly proportioned sense of the claims of others. not know that she differed much in this respect from average of people; but she differed from most other

members of the family. In these the egois
kept well in check by the altruistic.

After her in age came my father, born in Febr
Of him, of course, I say nothing here; but reserve a
is to be said for the chapter which follows.

Henry Spencer, the next eldest of the family, was a
and a half younger than my father. In several res
he was a favourable sample of the type. With no la
that self-assertion which shows itself in independenc
joined an unusual amount of sympathy, displaye
various ways.

A letter of his written from Macclesfield when he
about 21, describes an artisan-riot and the suppressio
it by the soldiery, which was going on while he wrot
artisan-riot reminding us of the Trades-Union riots
which we are now familiar, and, like them, utterly re
less not of the masters' interests only but of the int
of poor and unconcerned persons. The letter des
how he had been himself, to some extent, implicate
says that some of the riotous artisans, gathering r
women who were selling potatoes in the market-
and demanding to have them at half the price
eventually threw over some of the women's sacks; a
letter adds that he helped one of the women to pi
her scattered potatoes. Correspondence of later
exhibits him as having actively espoused the caus
some ill-used man in the establishment in which he
engaged, and as having suffered in consequence.
one occasion he took the proverbially unwise cours
defending a women against her husband, and, as u
met with no thanks from her. There was clearly a st
dash of chivalry in him.

Gratitude, too, was a marked trait, if we may ju
from a letter written when 22 to my father. He had l
apprenticed to a draper, and at the time in question

ng the part of journeyman, evidently his position, and not seeing his way towards ess in life. My father, who had accumulated deal by his teaching, had offered to furnish with capital to commence business, and this letter, ining the offer, is quite pathetic in its display of feel-

But at the same time that he expresses his thanks in uage which, though extreme, is manifestly genuine, he :—"In the first place I could not like at all to take nuch money from you which I perhaps should never it in my power to return." Evidently his gratitude not of the kind sarcastically defined as a keen sense vours to come.

hen some years later he did, however, commence busi- he proved very successful: quickly accumulating a derable capital. But by him, as by many others, exemplified the truth that unusual success in routine ess may become a snare, by prompting enterprises f a routine character, for which a different capacity is red. He entered into the lace-manufacture at the of its great prosperity, and he also speculated in -building. By both of these he lost—by the first ly; and, led at the same time as he was, by domestic ppiness, to spend much time away from home and ct his business, he ruined himself and died early.

t various facts besides those named show that from ood up he had displayed a fine nature. What in- ctual powers he possessed beyond such as his career lied, I cannot say, further than that I remember when oy, listening to his denunciation of poor-laws as being in principle: showing that he was given to inde- ident thinking about social affairs. Indeed he was a politician, going to the extent in those pre-reform rs of wearing a white hat, which was a symbol of licalism and exposed the wearer to insult. In his non- iformity, too, he was very decided; even going so far as

to blame his brother Thomas for enter
though the Wesleyanism in which they had a
up, did not imply dissent from Church-doctrin
from Church-discipline. But I suspect that his
were anti-ceremonial.

One other fact may be added. He had a marked se
of humour; differing in that respect from his brothers
whom the sense of humour was but ordinary. This
was inherited by his eldest son, W. A. Spencer, who
written some good squibs *à propos* of local affairs.

Of John Spencer, the son who came next in succes
I have nothing good to say. Along with an individu
of character which he had in common with the rest
had none of those higher traits without which the dis
of individuality becomes repellent. In letters, I
nowhere met with favourable references to him, nor
remember to have heard during my boyhood any
uttered in his praise. He was entirely egoistic, a
pursuit of personal advantage sacrificed the interests of
members of the family without scruple: pushing his c
in some cases—especially in the case of his brother He
widow—to the extent of cruelty.

He was a solicitor, and one or more of his bro
attributed the inequity of his conduct to converse
the law. This was, I think, an error. There is proof
in boyhood unamiable manifestations of character
frequent. In letters of his elder sister, there occur r
ences to him as "boasting John" and "blustering Jo
—descriptive names indicative of deficient sympa
Throughout life he was eminently self-asserting.
early illustration is furnished by the fact that he hea
a group of his companions in playing at soldiers dur
the war-times which filled the beginning of the centu
Boys then formed themselves into regiments which t
the names of French and English, and he was captain

nts. In later years he gave evidence of
s secession from the orthodox Wesleyans
easons. He disagreed upon a minor point of
A letter to his brother Thomas shows what
int was:—

have had considerable discussion here among our Body con-
Faith—whether it is the Gift of God, and whether it is our
pray for it. My opinion at present is, that it is not the *direct*
God, and that we should *not* pray for it. Will you give me
inion and reasons with scripture substantiations. We have six
reachers in a neighbouring circuit suspended from preaching on
of entertaining such opinions as I hold."

disagreement resulted in the formal separation of
f and some adherents. For the propagation of his
he built, or rather I suppose obtained the funds for
ng, a large chapel, still standing in Babington Lane,
In this he preached: his doctrine obtaining, I
the nickname of the "Derby faith." How long
iness lasted I cannot say—some few years, I fancy.
ther it was that his energies were in this way too
diverted from his profession, or whether it was that
secession he alienated clients, who probably most
n belonged to the Methodist connexion, or whether
auses operated, which seems probable, I cannot say;
er a time his non-success as a lawyer caused him to
te with his family to America: first of all to Illinois,
hen years later to California, where he died after
ing all his brothers.

mas, born in 1796, the member of the brotherhood to
I now come in order, was the one who became best
to the public—at one time widely known. His
or at any rate part of it, was passed as a teacher in
School near Derby. It was then a school of some
repute. Energetic and not without ambition, he
tly succeeded in obtaining sufficient funds for a

university career: loans from my father —I believe the larger part—of the resources St. John's, Cambridge, was his college, and h honours. His successes were the results not of any endowments but rather of a good memory and hard —work which undermined his health temporarily, think permanently. His appearance may be judge the adjoining portrait.

In the *Reminiscences, chiefly of Towns, Villages, and* an account of my uncle is given by the Rev. T. M author also of *Reminiscences of Oriel College and the Movement.* Mr. Mozley was well known in the last g tion as one of the reactionists in the English C well known, too, as editor of their quarterly orga *British Critic;* and perhaps still better known as one leader-writers in *The Times* in the days when it was "the Thunderer": the chief leader-writer I may the authority of Sir George Dasent, who had been the staff, and who told me that they looked up to as their head. He read mathematics with my uncle the long vacation of 1827, and, as preliminary to m characterization, I cannot do better than quot passages from Mr. Mozley's description of him:—

"Of one memory I must deliver myself, it looms so large, a obstinately recurrent. In so doing I feel like the lady who an importunate suitor just to get rid of him. However, I wish to forget Thomas Spencer, whom, after nearly sixty y remember with increasing respect, and even gratitude, not to sa tion. . . Mr. Spencer was Fellow of S. John's, a ninth wi one of Mr. Simeon's party, and the friend of a man I have heard highly spoken of, Archdeacon Law, son of the Bisho Mr. Spencer held a curacy for some time at Penzance, then muc out of the way than now, and more primitive. Then he h charge of a church at Clifton for a year or two, and was popu preacher."

Either Mr. Mozley's information or his memory is matter at fault. My uncle had previously been

mer in Norfolk, where he was at the same time tutor
squire's son, and after that he held, for some years,
llege-living of Stapleford near Cambridge.

college friend then gave him [after his residence at Clifton]
ll living of Charterhouse Hinton, between Bath and Frome,
two very steep hills to ascend from the former." •

may interpose the remark that the "living" was
to be called one in the pecuniary sense. It had
been endowed, partly from Queen Anne's Fund,
income of about £80 a year: not having had
e Reformation an independent existence, ecclesias-
onsidered. Strangely enough, the last incumbent,
n Catholic priest, was named Thomas Spencer.
ing my uncle Mr. Mozley goes on to say:—

as a decidedly fine-looking man, with a commanding figure,
ice, and a ready utterance. So the church was pretty well
e always worked himself up into something like a passion,
home exhausted."

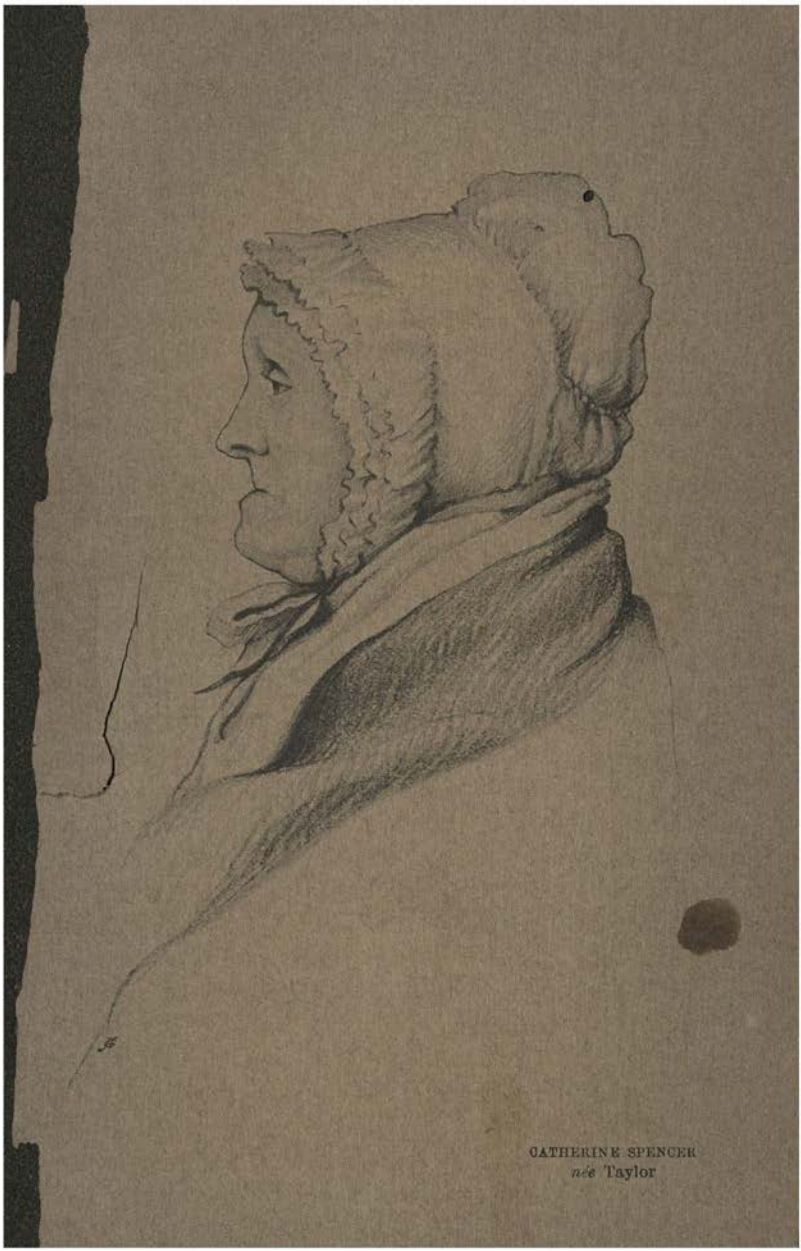
as so, he must have changed greatly in the course
ubsequent six years; for, from 1833 to 1836, when
ntly heard his preaching, I cannot recall any sign
ement. Indeed I should have described him as
y calm.

pencer was not at home in his village. He had none of the
ge of courtesy. Mrs. Day, the lady at the mansion, was a
he world, and prepared to make the best of everybody, and
well with her. But even with her he had a ruffle.
truth was poor Mr. Spencer was born before his time. He
former in Church and State, and he really anticipated some
ovements. He did not quite break out till after our brief
tance, but his heart was full and ready to overflow. He kept
g and busy warfare against the vicious administration of the
r Law. He was an agitator for Temperance before even the
ance Societies. He was early for the commutation of tithes,
the more equal distribution of Church funds. He published
ceedingly crude ideas for a radical change in church services,
defiance of all liturgical sentiment and principle."

r passages from Mr. Mozley's description I do not

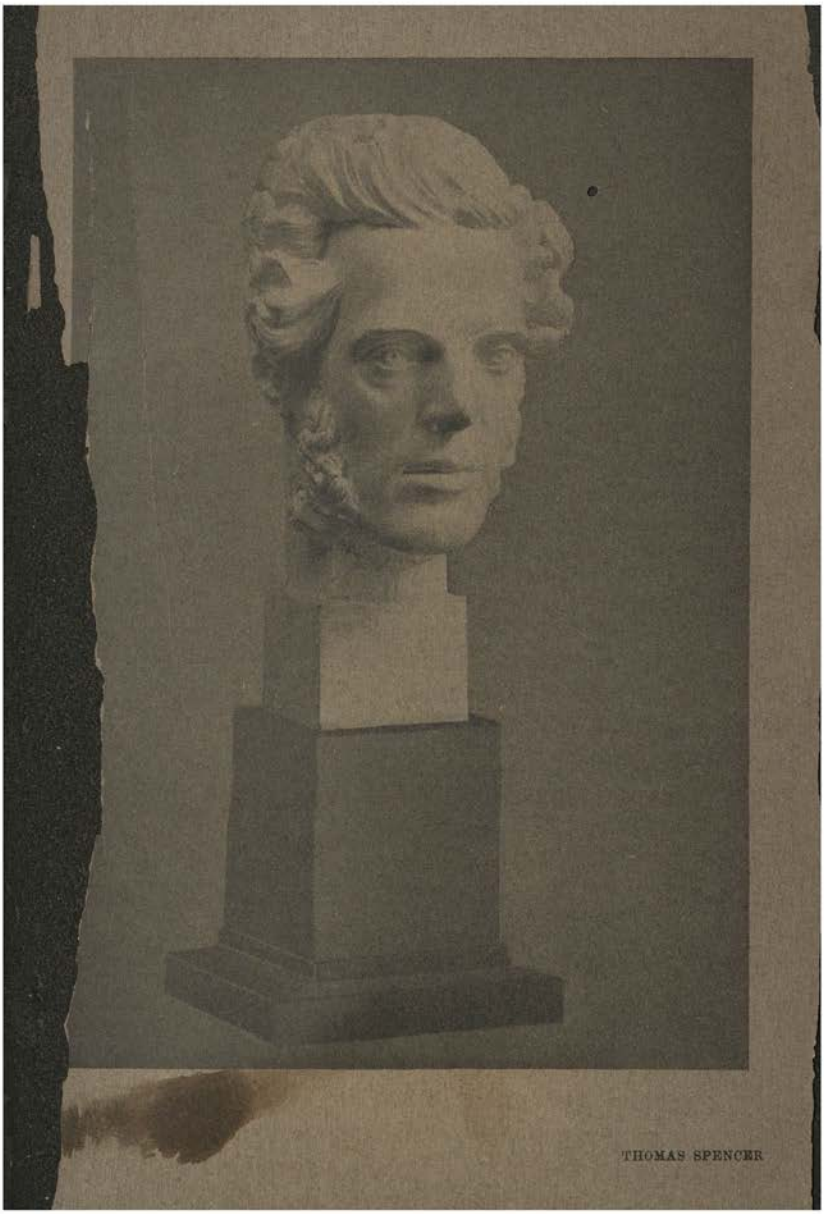
quote, partly because they are spoiled by exaggera
Probably his long-continued habit as a leading-a
writer encouraged the tendency to overstate, common
of us; for a leading article which kept within the
limits of truth, would lack the point and vigour for
readers look. But these extracts from Mr. Mozley's
represent the facts fairly well. They form a good
to what I have myself to say.

The above-mentioned Mr. Simeon was the leade
evangelical movement in Cambridge—a movement
the Church, which seems to have been parallel
Wesleyan movement outside of it. At any rate
were akin in their asceticism. Public amusemen
tabooed by both. My uncle was never, I believe,
the walls of a theatre; and I never heard of his att
concert. As to dancing, something more than ab
on his own part was implied by the answer he gav
during my youth, being with him at an evening
Bath, the hostess inquired why I did not join som
people who were waltzing. His explanation wa
Spencer ever dances." But the evangelicalism of
joined philanthropy with its asceticism; and m
quickly exhibited this by his activities at Hinton.
were no appliances for teaching, and he forthwit
school built and a master appointed. For the more
adults and those who were taught to read he pr
village-library. After a time he induced one of t
landowners to let out a tract in allotments. For the i
of comfort, as well as the encouragement of provide
with the co-operation of my aunt, established a clo
club. There were few, if any, good cottages; so he pre
built some—four, I think. And soon after his marria
went to the extent of having, at the parsonage, a
dinner on Sundays for labourers: now one group an
another. In course of years, however, he became con
of the mischiefs done by aid inadequately restraine



CATHERINE SPENCER
née Taylor

JANE HOLME
née Brettel



THOMAS SPENCER

the New Poor Law was passed he forthwith ovisions to Hinton, and, notwithstanding great duced the rates from £700 a year to £200 a ne same time increasing the comfort and prosperity arish. When the Bath Union, including Hinton, ed, he became the first Chairman of the Board of s. Besides sharing actively in various public ts in Bath and the neighbourhood, he wrote pamphlets on Religion and Politics, Ecclesiasticism, er-Book, Church-Reform, National Education, Corn- or-Laws, People's Rights, Legislative Meddling, etc.; ree in all, many of them having wide circulations, he extent of twenty-eight thousand.

stage of his career, and during my visit to Hinton modelled a life-sized bust of him—my first and pt of the kind. But I had no technical know- tever, and my plan for strengthening the neck to e head, failed: the neck cracked across.

ame became better known, my uncle's sphere of xtended, and he was frequently away during n distant places, speaking on one or other of ics—temperance more frequently than any other. owever, he returned home, even when one or d miles away, in time for the two Sunday services ve.

profoundly from those Church-of-England o think their duty consists in performing cere- conducting praises, offering prayers, and uttering nctions as do not offend the influential members flocks, his conception of the clerical office was e that of the old Hebrew prophets, who denounced g-doings of both people and rulers. He held that within his function to expose political injustices st on equitable laws. Hence it happened that he active part in the agitation for the repeal of the ws—attending meetings, giving lectures, writing

tracts. How conspicuously active he was, is
fact that he said grace at the first Anti-Corn
and that, continuing his relations with the
end, he said grace also at the last Anti-Corn-La
Among the State-appointed teachers of rectitu
was, I believe, one other avowed Free-trader, th
an active one; but with this qualified exception
was, strange to say, the only clergyman out
thousand who contended that the people of
mostly poor, should not be compelled to buy cor
ficially-enhanced prices to enrich English landlor
was not his only endeavour to further political eq
entered with energy into the movement for exte
franchise. He was a member of the first confer
at Birmingham to initiate the Complete Suffra
ment, and was a delegate to the subsequent
also held there, to frame, if possible, a basis of
with the Chartists—a futile experiment.

Here let me interrupt the narrative for a
indicate the personal results of his conscie
Between 1840 and 1845, one who will hereafte
E.A.B——, kept up with me a correspondence.
brother of his was then an undergraduate at O
paring for the Church. From one of E.A.B——
me, here is a passage:—

"My brother asked a fellow collegian of his (who come
if he knew a clergyman of the name of Spencer there
said: 'Do you mean Spencer of Hinton Charterhouse, for if
is as mad as a March hare.' What do you think of tha
has been figuring lately at some radical meeting for the re
Corn Laws, where he proposed the first resolution.—Pretty
for a clergyman!"

Certainly, quite mad from the clerical point of view!
could be more mad than offending his bishop by w
pamphlet on Church reform, and so shutting
chances of preferment? Or what could be m

[illegible] :—

[illegible] men] in one or two
gh a conscientious man could hardly do that and retain his
, but differing as he does so completely upon almost all
ll continues to hold an appointment under that church, an
which I believe to be a sinecure, or something like it."

are lessons for men who disregard the interests
lism as well as their own interests. They may
er not from a falling short of the truth but from
inversion of the truth.*

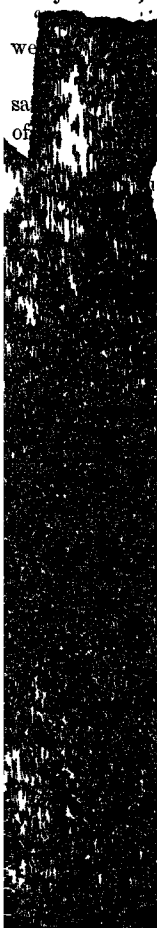
re than twenty years' residence at Hinton my
ed his incumbency and took up his abode for
Bath. Among several prompting motives, one
ire to establish a Church-Reform Association.
correspondence on the matter with a liberal-
gymen who agreed to co-operate; and, among
find a printed programme setting forth the
ew. But before the final step was taken, his
either did not agree to some of the proposed
else his courage failed him. At any rate he
roceed, and the project dropped through. Some
ater my uncle removed to London. There,
ng the *National Temperance Chronicle*, a large
h he wrote himself, he preached and lectured

uncle's retention of his office as clergyman, I may remark that,
ce, he thought it unwise to leave the Church, for the reason
so he would lose all power of effecting any reform in the
he instanced the Rev. Baptist Noel, a man of much influence,
seceded, lost all his influence. But, respecting the insinuation
tiousness, made by E. A. B——, the conclusive reply is that my
ed no dissent from the doctrines which, in taking orders,
cribed to. *I* do not know of any such, and certainly
did not. My uncle's efforts were not at all to change doctrines,
administration; and I am not aware that by taking orders he
o abide by the organization established for diffusion of those

Some [illegible]
notices of him should be published, and a meeti
at his house to arrange. I was requested to und
of the biographical sketches, but resisted; explain
did not approve of biographies which cont
laudatory things and omitted all drawbacks;
probably, some of my comments would be dislil
present agreed that unqualified praise is to be
and wished me to say whatever was requisite to
representation. Still I resisted, feeling sure
theoretical agreement would come to nothing, a
indication of a defect would be considered off
resistance was finally over-ruled, however. I
requested sketch, in which, as I considered, I
fully his many admirable traits, and touched a
truth demanded on points not so much to
Here it is:—

"In his general character Mr. Spencer may be rega
presented in a high degree the predominant peculi
Englishman. He possessed an unusual proportion of t
energy which is so distinctive of the race. His modes
action leaned strongly to the 'practical'—a quality by
nationally marked. Throughout life he exhibited a g
that English characteristic—independence. He was l
with the perseverance which makes us as a race 'not k
are beaten.' The active philanthropy by which we are
amongst nations, distinguished him amongst us. That u
which, on the whole, we are superior to our continental
atlantic neighbours was in him invariably manifested.
deficiencies he represented the Anglo-Saxon nature. Th
brusquerie of manner, and that want of tact in social int
which we are complained of as a people, were visible i
lacked those finer perceptions which are needful for the d
tion of beauty in nature and art; and in this respect also
race. Above all, however, he exhibited the English type o
in the habitual recognition of *duty*. The determinatior

which *ought* to be done, simply *because* it ought to be done, is a motive of action which has been shown to be almost peculiar to Englishmen—a motive which most other nations cannot understand. This motive was with Mr. Spencer a ruling one. In this respect, also, as in so many others, he was an intensified Englishman.



g upon these and other traits, a relative who knew him we

ed what was his predominant characteristic, I should sa sense of justice. This, I think, was the mainspring of s public actions, and was clearly operative in all the tions of his private life. It was the basis of the morality l his preaching. It was exemplified in each of his s. He was prompted by it to the parochial reforms e at Hinton; and by it supported through the opposi- parishioners at first raised against him. It stimulated he Anti-corn Law agitation. Enlisting his sympathies Representative Reform, it led him to take a prominent mplete Suffrage movement. And it was obviously a his proposals for Church Reform. All his opinions eventually to conform themselves to this ruling senti- d the centre of his system of thought, round which all ately gravitated. Though the prejudices of education ircumstances might, at, first, lead him to unjust con- was pretty sure, in process of time, to arrive at the is was repeatedly illustrated. Doctrines to which, in f his life he was adverse, slowly commended them- substantially equitable; and having done so, were as d as they were once opposed.'

ions can testify, he was generous. His generosity he peculiarity—family peculiarity it might in some d—that it was more seen in large things than in small ly acts of domestic life did not exhibit that power of hich was called out on important occasions. I ascribe moral deficiency than to an intellectual one. It had the s that want of *savoir faire* which he manifested—namely, power of perceiving the feelings which the minutiæ of vill produce in others. There go two things to the pro mpathetic behaviour. The one, an ability to enter into ings, which is *moral*; the other, a perception that those , which is *intellectual*. In this faculty of divining the s of emotion in others my late relative was somewhat d hence it happened that whilst in the more important

acts of life, where the feelings of others were clearly manifested, his sympathies were abundantly operative, they were less so in the details of daily conduct. It requires to be observed, however, that in this respect, as in most others, his character improved as he advanced in life. He grew yearly less exacting and more considerate. And in his last illness this change was manifested in a remarkable manner. Instead of being irritable under annoyances he became extremely patient and uncomplaining. He concealed much that he suffered that he might not pain others. He avoided giving trouble as much as possible; and expressed his thanks for every little assistance.

"The uniform success which attended him throughout the whole of his life until within the last few years, and the consciousness that success was due to his own intelligence, energy, and upr generated in him the belief that good conduct would, in a prosperity, and this led him to pass somewhat severe the unsuccessful. His intimate knowledge of pauper saw to be in nearly in all cases traceable to idleness and him in this view. When, however, some five years be he lost more than one half of his property, not throug his own, but from the trickery of the South Wales pany, he had personal experience of the fact that misfo where there had been no misconduct to entail it. practically that whilst the fate of each individual is p hands, it is partly dependent upon causes beyond h result of this hard lesson was morally beneficial to degree. He became much more tolerant of faults an ready to blame the shortcomings of those about him. allowances for the unfavourable circumstances of tho degraded habits of life. And if, from time to tim unduly harsh opinions of the idle, the drunken, or the sure, subsequently, to take at least some of the mitigatio It was during these last few years of his life, and in c the trials they brought him, that he acquired his power In earlier years his sermons consisted mainly of stern en rectitude. They were lessons on the duties of life— practical morality. And, being too uniformly pervaded trine that all could be contented and happy who did a they were not so true, and not so effective, as they migh The disasters of his later life, however, remedied this d put him in harmony with his hearers, most of whom ha suffered one form or other of misfortune. He had befo large portion of experience which others had had. H

gained that experience, and could speak to them upon a common ground—a thing which was previously impossible to him. For as it is true, physically, that we cannot duly sympathize with pain or illness until we have ourselves suffered them, so it is true, morally, that until we have borne unhappiness we cannot have a strong fellow-feeling with it.

"The charity in judging of conduct which Mr. Spencer thus gained in his later years, he early gained in judging of opinions. Throughout life he was the reverse of a bigot. Considering that his position was one tending to produce narrowness, he was liberal in the construction [illegible] ther men's views to a degree rarely paralleled. When good reason to think otherwise, he mostly credited ered from him, with sincerity. The doctrine of religious ried out consistently to the full; and this not pas- vely. Many years ago I remember hearing him in lemn all religious persecution, even in the case of liberality he continued to exhibit to the last in an in-, as I can personally testify. Wide as was the differ- s in religious beliefs, the repeated controversies we have d on in an amicable spirit; and I was both surprised find that, notwithstanding the strength of his convic- t, extreme as it was, led to no diminution of his kind ne.

s virtues may be justly classed that of forgivingness. ntment was liable to be at the time of offence, it was n call to recollection numerous cases in which, after a ne, all ground of irritation seemed forgotten, and as g was manifested as though nothing had happened. ther matters, his habit of revising his estimates of much catholicity.

int a foible—and perhaps in giving an outline of his e in candour bound to do so—I should say that he had minant love of approbation. This is a fault from which free, and those who take part in public life are especially bit it. In Mr. Spencer it was naturally strong; and his through life—his success at college, his position as pastor, authorship, and his connection with various popular tended to encourage it. I can truly say, however, what id of few similarly circumstanced—that, intimately as I him, I remember no instance in which this feeling caused ve from the course he thought right.

as one trait in his character which should be noticed. for the

purpose of illustrating the evil that may arise from the excess of a valuable quality. I refer to his power of application. He early manifested this in a marked degree. His university honours were mainly due to it. In later life he prosecuted, with untiring zeal, every project he took up. Such was his tendency to concentrate himself wholly upon the subject in hand, that during the period in which it occupied him, he manifested little or no interest in anything else. Whilst engaged in abolishing pauperism in his parish, his conversation was almost wholly on poor-law topics. At other times the Corn-Law question and the extension of the Suffrage filled his thoughts nearly to the exclusion of other things. Latterly he became abs[illegible] in th[illegible] Temperance cause. The result of this quality was, that w[illegible] conduced to his value as an active philanthropist, it w[illegible] to him as an individual. In proportion as his interest[illegible] became intense, it became weaker in all others. He g[illegible] gratification in things that had once been sources of [illegible] Originally endowed with a taste for music, he became [illegible] and all other arts. He year by year went less into soci[illegible] to take much interest in the sciences; and it needed [illegible] him to any species of exhibition to perceive that the m[illegible] industry and ingenuity had few charms for him. T[illegible] extreme concentration, and this limiting of the sympat[illegible] led, were indirectly amongst the causes of his p[illegible] Lecturing and writing on his favourite subjects acqui[illegible] an interest for him, and other kinds of occupation be[illegible] tive, that relaxation was almost impossible. His le[illegible] rest, for his mind was ever in pursuit of a new ar[illegible] illustration. He had no alternative but work or *enn*[illegible] a constant liability to trangress the laws of health. [illegible] over-application which entailed his illness during th[illegible] year. And hence, too, came the irresistible tempta[illegible] him, in spite of this warning, and in spite of constant[illegible] those around him, to again err in the same way as s[illegible] convalescent.

"Leaving out of sight some of the mental results pro[illegible] tendency to extreme concentration, which he himself latte[illegible] as injurious, I should say of his character, viewed as a [illegible] was one exhibiting continuous growth. Unlike those whos[illegible] are unalterably fixed at five-and-twenty, and who never [illegible] anything morally higher than they then display, he unde[illegible] but unceasing evolution. Giving his first vote, when [illegible] St. John's, for a Tory member of Parliament, he progr[illegible]

course of years to political principles of extreme liberality. Entering manhood as he did under the strong ecclesiastical bias of a university life, he gradually emancipated himself—became a zealous church reformer, and ended in condemning the union of Church and State. Though known during the earlier part of his parochial life as a pauper's friend, he ultimately saw that it was a false humanity to encourage idleness at the expense of industry, and through much opposition succeeding in working out a reform for which his parishioners eventually thanked him. Originally feeling but little sympathy with the Peace movement, he by-and-bye took an active part in it; and, though at one time he disagreed with them, he ultimately joined the [illegible] death-punishment. His views on education, and on [illegible] matters, underwent an analogous change. A corresponding advance was also traceable; and this more especially [illegible] years. That so much should be said of one subject [illegible] narrowing influences of a clergyman's life—influences [illegible] destroy what liberality may originally have existed—[illegible] remarkable, and says much for the superiority of his [illegible] few of those similarly placed display any like progress [illegible] character!"

[illegible] characterization met with the full approval of [illegible] brothers, my father and my uncle William, [illegible] evidence of its truthfulness; but entire [illegible] not in such cases permissible. At a subsequent [illegible] ing of his admirers the sketch was read to [illegible] result was as I expected. No positive dissent was expressed, but it was received in silence. [illegible] other sketches it was, however, sent to the [illegible] the understanding that it was to appear in [illegible] *Temperance Chronicle*. But a few days after- [illegible] it was still in the printers' hands, my aunt [illegible] me in a state of some agitation, and asked [illegible] would withdraw this sketch. "Certainly," I [illegible] you know that I did not wish to write it—[illegible] needed, and I am perfectly ready that it should [illegible]." She went away with the implied assent to [illegible]. What resulted, however, was this:—all its parts were published, while those which con-

tained anything in the shape of qualification were suppressed. And thus I was defeated.

But, the small drawbacks having been allowed for, my uncle was very greatly to be admired as an absolutely sincere man, whose almost exclusive aim in life was the public welfare. In evidence of the feeling with which he was regarded by those who had many years' experience of him, I may add that, when he was taken from London to Hinton to be buried, I was witness to the fact that, quite unexpectedly, the inhabitants of the Pa[illegible] *en masse* met the funeral carriages on their approach, [illegible] long procession.

Of the youngest son, William, there is r[illegible] to be said. Though he had sundry trait[illegible] with the rest, he had, on the whole, a le[illegible] character. Of natural ability scarcely exceedi[illegible] he was distinguished less by extent of inte[illegible] sitions than by general soundness of sense, [illegible] dash of originality. He carried on the sc[illegible] grandfather had ceased to teach; and, wh[illegible] covered from a breakdown in health, whi[illegible] years, he resumed it for a period: a fac[illegible] because I was, during this second perio[illegible] pupils.

Naturally pleasant-tempered, he was, I sus[illegible] life a little repressed or perhaps snubbed, by [illegible] as being the youngest; and having, like the r[illegible] pendent, self-asserting nature, this generated [illegible] to take offence at slights, and, with him, [illegible] taken was lasting. This trait led from time [illegible] coolness with some members of the famil[illegible] as with some friends; and it tended to reduce [illegible] solitary life which proved eventually injurio[illegible] were sundry fine traits thus obscured—a goo[illegible] generosity, an active interest in the welfare of[illegible]

on whose behalf he many times took great trouble, and a similar readiness to give his attention to the affairs of friends. Indeed he became with sundry of them a trusted adviser.

I think he was generally considered somewhat odd. Partly this estimate of him was consequent on the ill-judged remarks he made in the effort to say good things. As described above, Henry, an elder brother, had a great deal of humour. When I was a boy he had always something jocose to say to me when we met. William had desire to be facetious, without the power of d his endeavours sometimes ended in giving ce altogether unintended, however, for there ncy to sarcasm in him.

e his brothers, an active part in politics, he xtreme a liberal: preserving, rather, his con- the Whig party than verging into radical- hough in religious opinions a nonconformist, rmity did not lead him to diverge from n so much as did the rest.

rked traits were thus common to all the brothers. was very decided; and, as a consequence they ded as more or less eccentric. The implication was in them a smaller respect for authority exists, or, what is the same thing, a greater an usual to assert personal judgment in defiance .

ith this characteristic, and partly perhaps as a t, there went a general absence of reticence. hers were in the habit of saying very much what ght, whether on impersonal questions or on ones. Necessarily there continually arose differ- opinion among them, which, expressed without straint, caused disputes. In a letter from my uncle o my father, I find a passage indicating this:—

"As we admit that every one of us more or less is liable to these misfortunes, it would not be amiss if we were to consider the most effectual method of removing the cause of many of them. Then, in the first place, we should encourage in us as much as possible a love for peace and an aversion to contention and such controversies as lead to serious dissensions; without this sense of it (which seems to be the foundation of amendment) little success may be expected. 2ndly. It is a good plan after a quarrel to weigh coolly both sides of the question and the cause which provokes to words; by the first we should learn not to judge too rashly, by the last we should perceive those positive denials, those harsh contradictions which stir up anger; this would give us a claim to be master of language which is softer, yet conclusive, a manner equally commanding but milder. Hastiness in frequently the cause, consideration and patience i necessary, a flat contradiction seldom answers any g quently begets dislike, borders on stupidity, shows a w it is a breach of politeness, much self-control is essen my pen, who am I addressing? Is it not my brother, e prudent, more capable, more loving, most affectionate, l blush and write no more."

The tendency to disagree, here implied, persiste life. Whenever they were together, some other, mostly religious, or political, o scientific, was sure to be raised; and as, alth their chief views they diverged in details arguments which not unfrequently ended in Doubtless a part cause of this was a strong reg While very many people do not care much opinions they hear expressed are correct or not the Spencer family usually cared a great dea concerning right and wrong, truth and error, was to them. Of course there were apt to resu troversies.

Nevertheless the brothers had much respec another; and, in early days, as in later life, t many expressions of mutual regard. "What a it is to have such a brother," says Thomas in o letters written in youth concerning Henry; and i place I see Henry speaking of "the noble Thomas.

over, they appear to have had in common an affectionate respect for my father, who had insensibly come into the position of head of the house, in consequence of the early abdication of my grandfather, rendered passive by his melancholy mood. Says Henry in one of his letters:—

"May you ever be rewarded according to your merit. May you ever remain the standard as you are to our family, may you ever be as much beloved by them as at present. Lastly may you be fortunate enough to have a woman for your wife that is as worthy as yourself."

[redacted]described tendency to discuss, and to diverge
her, was naturally accompanied by a tendency
n the beliefs in which they were brought up.
y deviated into further nonconformities.
s Wesleyans, they dissented more or less from
issent; and, in the case of my uncle Thomas,
vas at first a change towards conformity, the
tendency was subsequently shown in a very
position to ecclesiasticism. So was it politi-
all of them Whigs, whose creed at that
ively uniform, they did not adopt party
t had special opinions of their own. And
criticized current views respecting manners

ative traits which accompanied these positive
name one—a comparatively small interest in
a boy I rarely if ever heard among them any
oyal personages, or court doings, or anything
ishops and lords, or any agents of the ruling
eir conversation ever tended towards the im-
s a further negative trait I may mention that
o considerable leaning towards literature. Their
never referred to poetry, or fiction, or the drama.
he reading of history carried to any extent by
d, though in early life they were all musical, the
general had no great attractions. It was rather

the scientific interpretations and moral aspects of things which occupied their thoughts.

To sum up, the traits common to them of most import to be here noted were—independence, self-asserting judgment, the tendency to nonconformity, and the unrestrained display of their sentiments and opinions; more especially in respect of political, social, religious, and ethical matters.

CHAPTER III.

PARENTS.

born in 1790, whose Christian name was William who was distinguished as George, because there r brother named William, was the eldest of the thers. A passage quoted at the close of the will justify the remark that he was "the flower to use a mixed metaphor which, absurd though ned general currency. To faculties which he n with the rest (except the humour of Henry stic facility of Thomas) he added faculties they n of. One was inventive ability, and another erception, joined with skill of hand. In some he was morally their superior. To exclude tion of my motive for saying this, let me join confession that in sundry respects I am his ave in certain faculties specially adapting me to inherited from him with increase, I consider in many ways falling short of him, both intelnd emotionally as well as physically.

not robust in the full sense, he had a constitun was well balanced and capable of considerable e as witness the fact that he, when a young company with two of his brothers, walked sixty a day. Standing six feet when shod, he was hy for a well-built figure and a carriage which

united dignity and grace in a degree rarely equalled. I never saw anyone walk better. This trait was so marked, even after he was 70, that ladies turned round to watch him when he had passed: a fact I recently verified by appealing to one who had done so. But there is independent testimony on this point in the second series of the Rev. Thomas Mozley's *Reminiscences, &c.* Here is his description:—

"He was a tall, spare, upright figure, more decidedly good-looking than my clerical friend James Dean, of about the same build, with the tight-fitting blue frock-coat of the period. With the advantage of such a figure and of an equable movement, he could not [illegible] street without everybody in it becoming immediately [illegible] fact" (vol. ii, p. 144).

Now that I have quoted Mr. Mozley on [illegible] occurs to me that I may with advantage q[illegible] various other points. Before he studied und[illegible] Thomas he was a pupil of my father, and h[illegible] good deal about him. In the *Reminiscences of* [illegible] *&c.*, there was given in vol. I, pp. 145–9 [illegible] description of his ideas and sentiments, to w[illegible] it needful to take exception publicly. Th[illegible] that in his second autobiographic work, *chiefly of Towns, Villages, and Schools*, Mr. M[illegible] reply to my protests; and, in doing so, devote[illegible] chapters to an account of my father. Before [illegible] statements, it will be well to indicate the exte[illegible] many of them must be discounted: the need[illegible] being measured by an example. Incidentally i[illegible] my works, he describes them as an "imposi[illegible] which occupies several yards of shelf in m[illegible] libraries" (vol. I, p. 146). The least number co[illegible] the word "several" is three, and at the time M[illegible] wrote, the volumes I had published occupied 21 [illegible] less than a fifth. Picturesqueness and vigour a[illegible] less achieved by over-statements of this kind, w[illegible] common with Mr. Mozley; but obviously, in ma[illegible]

they must be seriously misleading. Premising this, let me now give sundry passages from his two series of reminiscences: making, on some of them, the requisite qualifying comments.

After introducing his account in the second series by the statement that "Mr. George Spencer was a considerable factor in my education, and consequently of my being," Mr. Mozley presently says:—

> "Everybody liked him; but all the elders made the same remark, that Mr. Spencer discussed speculative questions instead whole, or the most of his attention to teaching. Not any complaint as to the results" (vol. ii, p. 145).

1818–19, during which my father gave lessons s and sisters but not to him—lessons, however, as sometimes present, he goes onto say:—

> an intruder, but it was always a treat to have a talk he more if there was some disagreement. In the lidays of 1821 or 1822, I went regularly to his house elid, and learnt the two first books, I may almost say, ing I have learnt in my life" (*Ibid.*).
>
> s at home my recollection of Mr. Spencer is that he stener as well as a good talker, and that I never t of variety in his topics. These were ethical and ions. When Mr. Spencer, with his wife, joined our le in the evening, his talk was perhaps more broken s tea-table talk is apt to be. We very early came to hat Mr. Spencer had chosen his employment, which sant, but could not be very remunerative, as the only of disseminating his philosophy" (*Ibid.*, p. 146).

ther been a man of independent means, this, very probable, would have been possible; but that he had been born to his occupation had chosen it, and considering that his income ed almost wholly from it, the supposition was a one.

first series of reminiscences Mr. Mozley had my father as "a strenuous upholder of truth,

justice, and purity, but without any faith or religion whatever, as far as one could see" (vol. ii, p. 267). Referring in his second series to my protests, he says:—

"Mr. Herbert Spencer objects to these words. I really think that if he had objected that truth, justice, and purity, and a life spent, with some sacrifice, in inculcating them, was itself a religion in effect, and not without a form, being indeed a presence and a power in a great town, I should have felt very much moved, even though unable to see my way to any truer expression of my meaning" (vol. ii, p. 147).

I had given to Mr. Mozley quotations from various lette
which yielded clear disproof of his statemer
apparently no effect on him: his explanati
religion, as he understood it, included t
demonstrations which my father did not ma
said:—

"Spencer never recognized any religious authority
social worship ended inevitably in degradation, and w
untruthful and unreal" (*First Series*, vol. i, p. 149).

Such being his view (and in large measu
Mr. Mozley, as he says in his second series,
conclusion that Mr. Spencer had no religion
then attached to that word" (vol. ii, p. 146). T
belief that without such forms as are used by r
there can be no substance of Christianity
belief that the Quakers, for example, are not C

Concerning other opinions of my father, h
further passages of interest:—

"I had derived straight from the elder Spencer a co
nance to all living authority and a suspicion of all ordi
acquiring knowledge. From him I had learnt to beli
you were simply taught you did not really learn; and t
who wished to know things really must rummage them o
in all sorts of ways, the odder, the more out of the way, t
cult, all the better." (*First Series*, vol. i, p. 146.)

Everyone may see, especially from its closing
this statement should be largely discounted.
which it adumbrates is that my father in all

cated self-help and independent exploration, rather than passive recipience. The following also requires toning down:—

"He used to insist on the propriety, indeed the honesty, of always employing the same word for the same thing, and not attempting to please the ear of the hearer or the reader by the use of words not really synonymous as meaning the same. In this he anticipated the Revisers of the Authorized version, though not with the same intent." (*Ib.*, p. 147.)

is another passage which is but partially true:—

encer's philosophy might be materialistic in its tone ut it was ethical, social, and political—that is, in to man and to his own inner sense. It was abstract, the politics of the day, and perhaps had no decided m. I do not remember that he ever touched on the rial existences." (*Second Series*, vol. ii, p. 151.)

as a pronounced Whig or something more. describing him as having "to avoid the y." Mr. Mozley had said that he had little *nal* politics, he would have been right. nt is wrong as it stands. The following gh partially correct, needs a good deal of

lasses, privileges, ranks, honours, and all like n vanity and ambition, he regarded as essentially ured indeed, but steadily counteracted and under- their final extinction. I should say the only right ch things was that of sufferance, or toleration under s." (*Ib.*, vol. ii, p. 166.)

is much truth in this statement, is implied by my father would never take off his hat to natter of what rank, and by the further fact uld not be induced to address anyone as r as "Reverend": all his letters were addressed hile ignoring those forms of Christian worship Mozley thought essential, he did his best to carry thought Christian principles, in the direction of

class-relations as in other directions. But his views were less extreme than is here asserted; for when I was a young man he shook his head at the anti-monarchical views I sometimes uttered.

One further extract only will I give. It well illustrates Mr. Mozley's biassed judgments. After saying how weary my father must have been in "having to go over Euclid day by day for half a century with all sorts of pupils," he speaks of receiving from him late in life "a little work likely to surprise anyone not familiar with the character."

"It was entitled 'Inventional Geometry. A S Problems, and Explanations, intended to familiar geometrical conceptions, to exercise his inventive fa him for Euclid and the higher mathematics.' This as well as curious manual contains about as much lal scattering and shattering of brains, as could conveni into 446 questions, thirty-two pages, and a penny pos of the questions are considerably more difficult th (*Ib.*, vol. ii, p. 163.)

To show the quality of this representati first place, state the fact, observed by mysel become so eager in seeking solutions for as to regard their geometry-lesson as the cl week. I may add the kindred fact that, amo through the system by my father, it was for some to ask for problems to solve during Again there is the fact that my father's li been adopted in more than one of our publi is widely used in America. And then comes conclusive fact that Mr. Francis C. Turner, twice asked me for permission to issue an ed *Inventional Geometry* in a form better fitted for u (which I did not grant), read a eulogistic paper o at the Oxford Conference of the "Teachers' Guil in which he described it as "of the greatest contended that "this pre-Euclidean geometry

ou[illegible] enter the *curriculum* of all schools in which mathematical studies are begun, and should replace, in the elementary schools, the didactic and unsuggestive teaching of South Kensington." To which add that Prof. Hudson, of King's College, London, on the strength of his own experience "agreed entirely with Mr. Turner"; and that his opinion was endorsed by two other male teachers and by three female teachers: no dissent being expressed by anyone.*

The origin of the perversions of judgment thus exemplified Mr. Mozley, is not difficult to perceive. Under my father d into independent ways of thinking, and had ring of authority to an extreme. When he ith the leaders of the Oxford Movement, re-establish authority, they presently caused revulsion, and accompanying repugnance to es he had been subject to. In the above orized geometry *versus* authorized geometry, ongly pronounced. It affected all his ly warped his conceptions of my father's aching. Probably he was himself aware of ntiously endeavoured to guard against it, tial success.

his portrait he has drawn (called a caricaer brother, the Rev. Arthur Mozley, also a er) serves to bring out certain pronounced which I might have overlooked, and others er indicated by a non-relative than by me. to Mr. Mozley for furnishing me with so r my own portrait, to which I now pass.

s career as a teacher dated from boyhood—suppose, in his father's school; and he was is boyhood when he gave private lessons. I im speak of the pride he felt when, on going ddesden Hall, where he had as pupils the

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children of Sir Robert Wilmot, he was promoted from a boy's jacket to a coat. He commenced teaching elsewhere while still only seventeen; notably in the family of the leading physician, Dr. Fox, when but little older than the young Foxes: the relation then initiated between him and them being such that throughout life they continued to call one another by their Christian names. It seems probable that his natural tendency towards non-coercive treatment, was accentuated during these early days, when the attitude of master was scarcely practicable, and the attitude of friend in a measure necessitated. [illegible] his policy continued always to be thu[illegible] Among illustrations was his method of d[illegible] gressors, during the years in which he ca[illegible] in addition to his private teaching. Thi[illegible] form some of the boys into a jury, and to[illegible] investigated in a judicial manner; finall[illegible] decide on the punishment. The result [illegible] found it needful to mitigate the sentenc[illegible] conduced to friendly relations between him[illegible] The kind of feeling entertained for him [illegible] the following passage in a letter from one [illegible] some years a private pupil of his—Lady W[illegible] writes:—

"Looking back on those lessons, the feelings of [illegible] gratitude remain, while the special subjects have [illegible] mind; but I still possess wonderfully neat copy bo[illegible] questions on Euclid, astronomy and physics, which [illegible] understood; and perhaps without much difficulty [illegible] Mr. Spencer was remarkable for his calmness, patience, [illegible] we used to think he had power over circumstances [illegible] ruffled him. Being myself brought up in a strictly e[illegible] the new ideas he suggested on religious subjects were [illegible] and his facility in quoting scripture was evidence of l[illegible] the Bible. He was so truly sympathetic too, and n[illegible] trouble to listen to complaints or grudge time, to [illegible] difficulties, suggesting ideas which seemed to expan[illegible] As a girl I quite worshipped Mr. Spencer, and shall e[illegible]

to have known and had the friendship of so truly great and good a man.

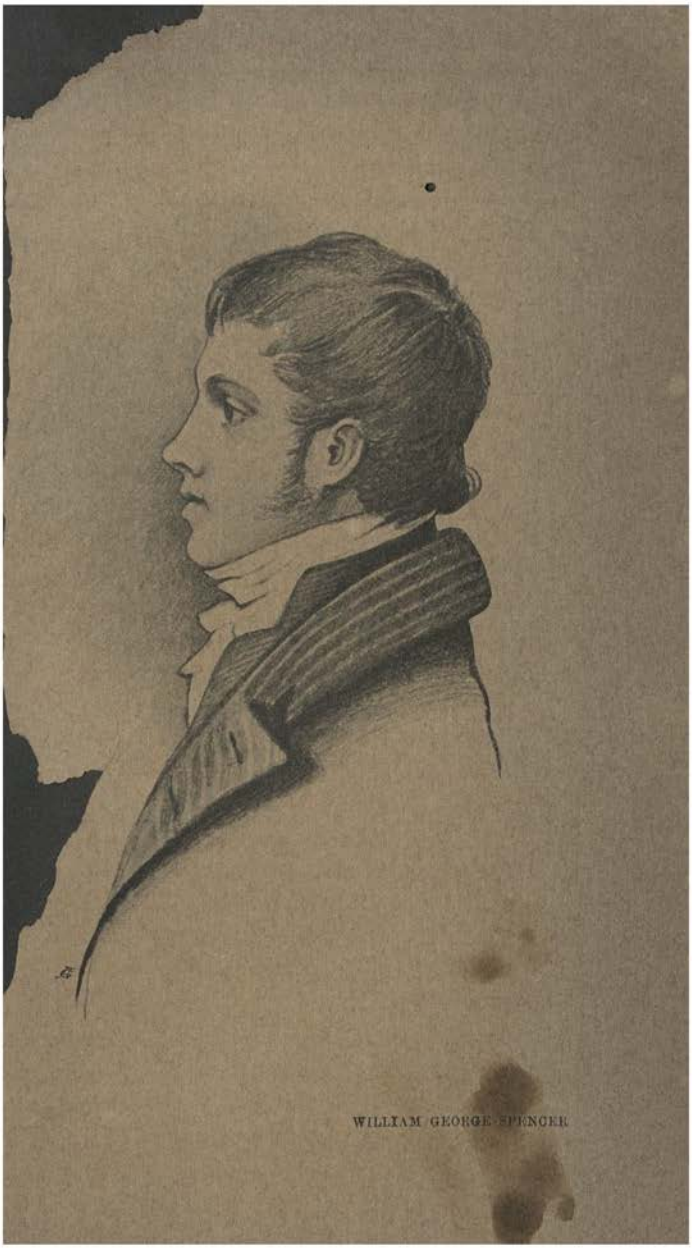
Absolute punctuality in his teaching-appointments was one of his traits—a trait naturally resulting from that regard for others' claims which he displayed in all ways. But while he was punctual in commencing his lessons he was not so in leaving them off. Supposing other engagements permitted, they would often continue long beyond the hour—a habit which, late in his life, I used to observe with annoyance, for he had then no spare strength to spend. as the thought of others' improvement was t that, on some occasions, he gave *gratis* oung man of the artisan class, of whom he opinion, he would invite to come occasion- g, to receive an informal lesson of one or an recall the faces of three such. This he r to have been relaxing.

f lower positions was curiously an old Quaker pedlar, who e villages, supplying the aged ther invited him, whenever Derby come to our house for tea and an hour on. Altruistic feeling was shown, too, enants (he had a number of small houses) looked after and for whom he frequently ays he would step out of his way to kick pavement lest someone should trip over it. s quarrelling he stopped to expostulate; never pass a man who was ill-treating his trying to make him behave better.* The

e to his habit of expostulation recalls an anecdote he told h once resulted. While he was travelling (between Derby I think) there got on to the coach a man who was half father entered into conversation with him, and sought to by pointing out the evils resulting from it. After listening for a time the man replied—"Well y'see, master, there mun s, and I'm o' that sort."

wish to advance human welfare, taking an impersonal form, sometimes prompted extravagant acts. Two instances I well remember. The Society of Arts brought out an educational microscope at a low price—two or three pounds, perhaps. He bought one of these, though he had no appreciable use for it, for he was then getting old. When I asked why he had done a thing he could so ill afford to do, the reply was that he considered the undertaking a very useful one and wished to encourage it. The other extravagance resulted from the issue of Dr. Vaugh[illegible] work, *The Age of Great Cities*. He was grea[illegible] this, and, thinking it would do good, he bo[illegible] to lend about among friends and others.

Great firmness in carrying out what [illegible] be right was a marked trait. I cannot r[illegible] of yielding. Those unconventionalities in [illegible] of address and forms of salutation[illegible] illustrating one of Mr. Mozley'[illegible] to without exception. There [illegible] he similarly persisted. He n[illegible] of mourning, even for father or m[illegible] that such signs were in so many case[illegible] should be discouraged. So was it [illegible] general. There was no change in it d[illegible] of his life which I remember. A kind[illegible] which satisfied his own tastes in respec[illegible] and appearance, was adhered to through[illegible] of fashion. Indeed, the thought of any c[illegible] his tailor respecting the style of the day, [illegible] smile by its incongruity. Among various o[illegible] from usage I may name his resistance to [illegible] elections. He disapproved the practice [illegible] refused to give any intimation about his vo[illegible] persistence in unusual courses of conduct, [illegible] (as addressing everyone "Mr.") liable to [illegible] never seemed to produce alienation. Partly



WILLIAM GEORGE SPENCER

suavity was great and partly because his sincerity was manifest, he was accepted by all on his own terms and invariably treated with friendliness and courtesy.

Respecting his intellectual powers something has been said. Unusual keenness of the senses, which is one factor in discrimination—the basis of all intelligence—characterized him. Joined with quickness of observation and skill of hand, this gave that artistic faculty I have already would have made a first rate portrait-painter, what little he did without any instruction ely any practice; for his life was too much rmit much. The annexed portrait is after a self made at the age of 28, by the aid of two . Among other products of his pencil was a n court, of Jeremiah Brandreth, a man tried n—a sketch afterwards engraved. That he ieved reputation as a sculptor is also probable, indred evidences. He did very little, but that The delicacy of manipulation implied by these nguished him in various directions, down to even to the cutting of a pen or pencil, which se and finish about it I never could approach, t awkward. As an experimental investigator e been admirable, as was often shown when ectrical and pneumatic experiments for the his pupils. But that he would have been a y good physical explorer, I am by no means ere was a constitutional defect of judgment shall presently say something. Along with nipulative skill may fitly be named the trait ss. Though not answering to Mr. Mozley's lescription, it was doubtless marked; and, se exercised in small matters, was exercised his *Inventional Geometry.*

ociated with his artistic and inventive faculideality. Improvement was his watchword

always and everywhere. One curious manifestation was his particularity of expression, even in small matters. He could not despatch a note concerning an appointment without first writing a rough draft and, after making erasures and interlineations, copying it. Emendations in books were prompted by this desire for perfect fitness. I have a copy of Chambers's *Euclid* which is full of words crossed out and marginal substitutions. He thus made corrections not only where some advantage might possibly result, but exercised his critical faculty where no value. One of the concomitants was a habit of revising dictionaries. A copy of Walker's, which is full of amendments. When Webster's appeared adopted that instead, and sixty per cent. of have some addition, or some modification of

This love of ideal completeness not only led to wasteful expenditure of time and energy, in some cases led to serious evils—more especially in delay over his *Lucid Shorthand.** He never could cease making alterations in details—prefixes, contraries, and ways of writing certain words; and this exemplified in an extreme degree, led to the large ends to small ends.

There remains only to name the one grea he was not kind to my mother. Exactin siderate, he did not habitually display that sy should characterize the marital relation. habit of deciding on a course of conduct in it regardless of circumstances, was here played. He held, for instance, that everyone clearly, and that those who did not ought resulting evil. Hence, if he did not unc question my mother put, he would remain

* The name he choose for it was *Legible Shorthand*, years after his death, I published it, I found that this title priated, and had to choose another.

asking what the question was, and letting it go unanswered. He continued this habit all through life, notwithstanding its futility: there resulted no improvement. Of course behaviour variously influenced in analogous ways, tended towards chronic alienation. It was not that sympathy was absent, but it was habitually repressed in pursuance of fixed determinations; for when my mother was unwell [illegible] due manifestation of tenderness. Indeed, during [illegible]rs of her life his solicitude about her was [illegible]believe that the depression caused by his [illegible] perhaps with an awakening to the fact [illegible]t been so careful of her as he ought to have [illegible]h to do with his death: rendering him less [illegible]sting the illness which carried him off in 1866. [illegible]s co-operated in producing this conduct so [illegible]iance with his usual character. He had a [illegible]f that "passion for reforming the world" [illegible]helley; and, as is implied by Mr. Mozley's [illegible] ever thinking either of self-improvement or [illegible]vement of others. I doubt not that during [illegible]ent my mother displayed interest in his [illegible]ious interest, prompted by the relation then [illegible]een them. After marriage she gave little or [illegible]such interest, and my father was doubtless [illegible]ointed. His disappointment was the greater [illegible]was not aware that intellectual activity in [illegible]able to be diminished after marriage by the [illegible]etween individuation and reproduction every-[illegible]ive throughout the organic world; and that [illegible]intellectual activity as is natural, and still [illegible]hich is artificial, is restrained. The remain-[illegible]as that chronic irritability consequent on his [illegible]order, which set in some two or three years [illegible]ge and continued during the rest of his life. [illegible]w that he was conscious of this abnormal lack [illegible]over temper; but, as unhappily I can testify

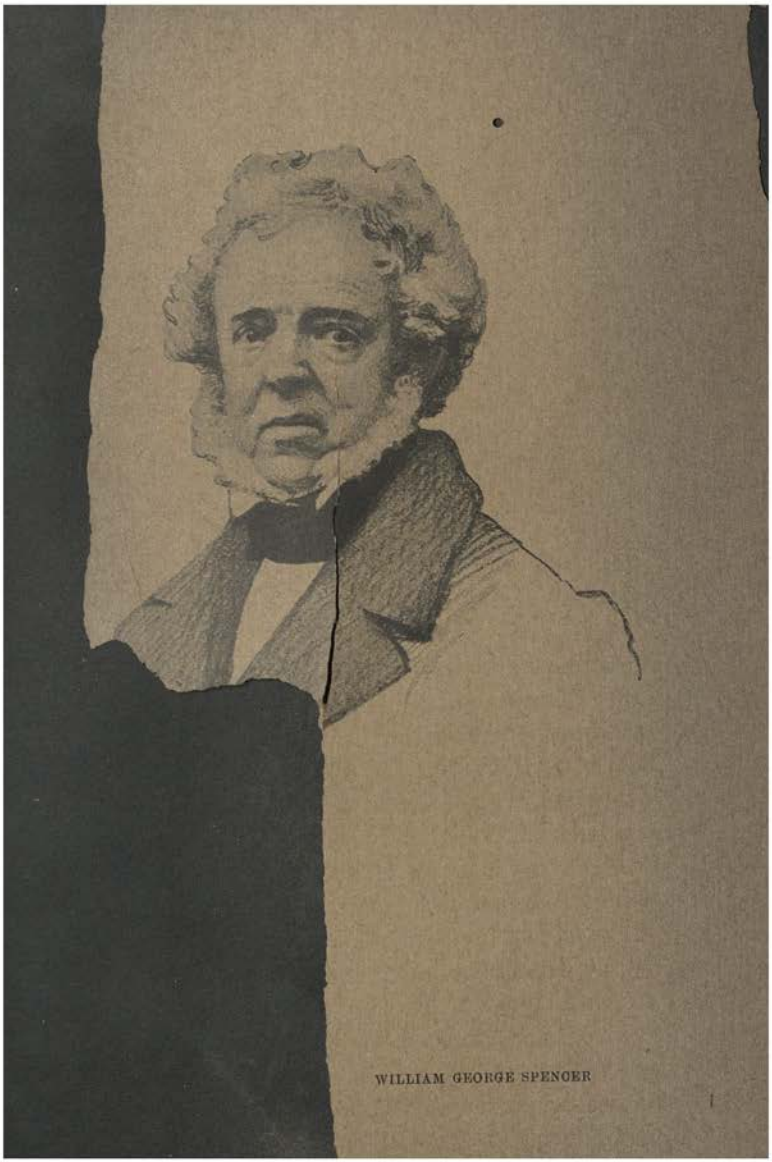
from personal experience, consciousness of such lack does not exclude the evil or much mitigate it.

While not ignoring this serious defect (which in the absence of these causes would probably never have been manifested), I contemplate my father's nature with much admiration. On looking round among those I have known, I cannot find anyone of higher type.

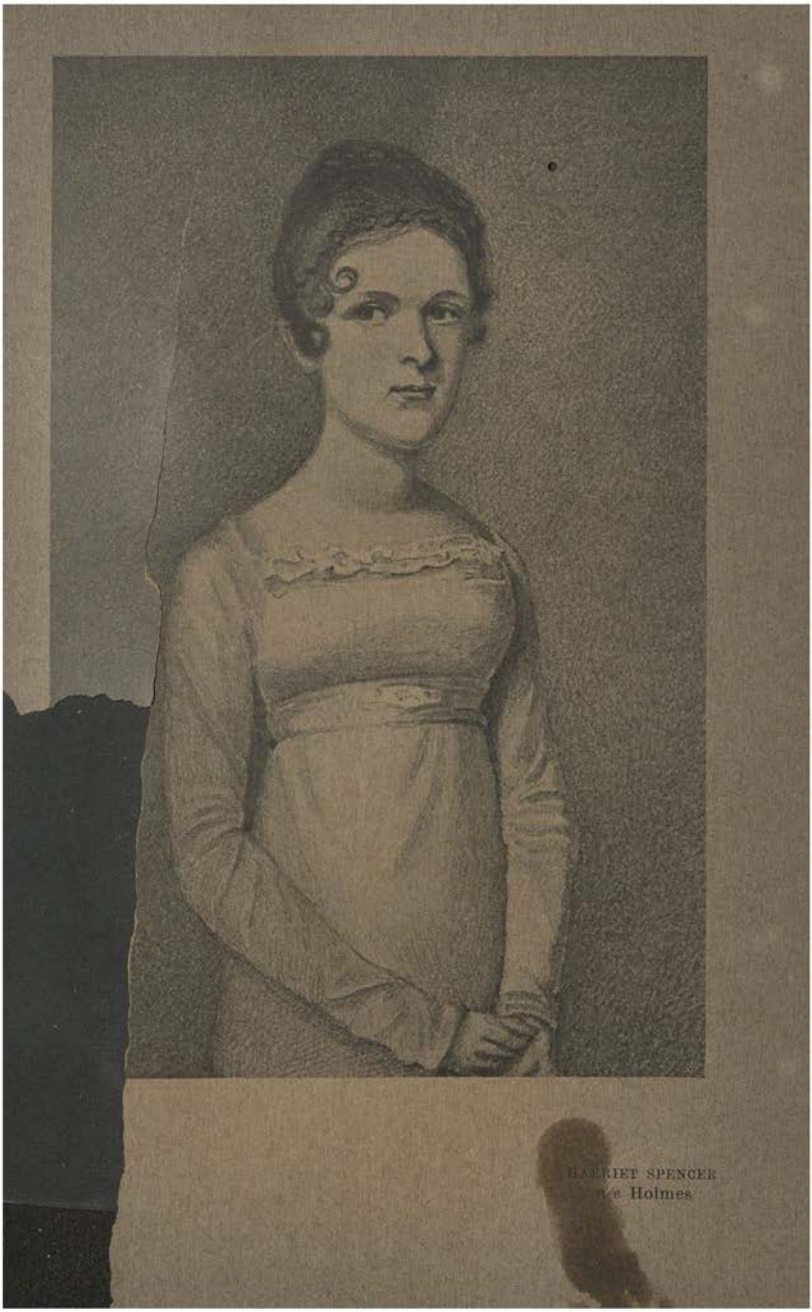
The portrait here given is drawn from a photo[illegible] when he was over seventy.

Concerning my mother, *née* Harriet Hol[illegible] the fact first to be named is that no signs [illegible] in her of that small infusion of Huguenot b[illegible] of Hussite blood, along one line of ancestry, w[illegible] inferred. So far from showing any ingra[illegible] formity, she rather displayed an ingrained co[illegible] is true that, brought up as a Wesleyan and [illegible] Wesleyanism throughout life, she might, acco[illegible] understanding of the word, be classed as a n[illegible] But she simply accepted and retained the be[illegible] her in early days, and would have similarly [illegible] retained another set of beliefs. I never he[illegible] any criticism on a pulpit-utterance, or expr[illegible] pendent judgments on religious, ethical, or p[illegible] tions. Constitutionally she was averse to c[illegible] there may have been a tendency, necessari[illegible] amount, of the kind to be expected. In con[illegible] the general principle of the limitation of here[illegible] is possible that this tendency manifested itsel[illegible] males of the line; or, otherwise, as happens in[illegible] it may have been latent, and ready to be mani[illegible] fit conditions.

The engagement between my father and [illegible] extending over a period of six or seven years, w[illegible] indicated, persistently opposed by my maternal gr[illegible] and, during a part of this interval, my moth[illegible]



WILLIAM GEORGE SPENCER



HARRIET SPENCER
w/e Holmes

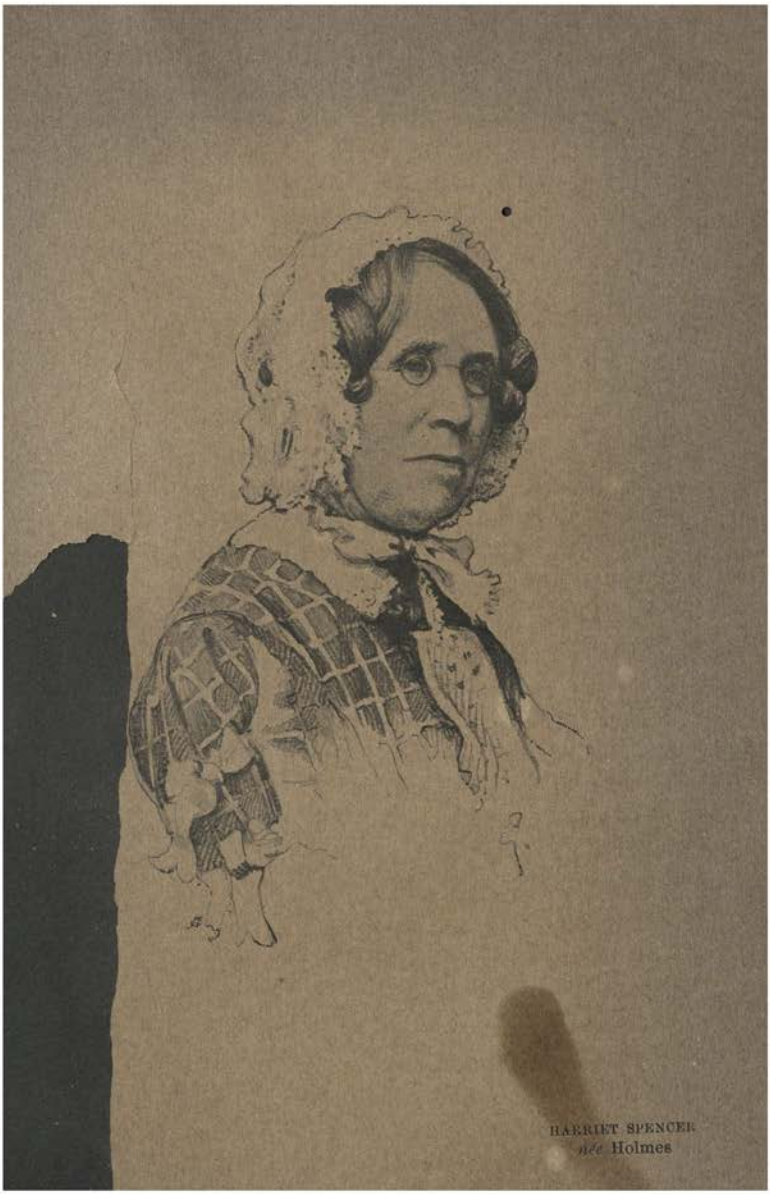
suance of the ideas of filial duty still prevailing at that time, broke off the engagement. How it came to be renewed I do not know; but most likely the interdict ceased only when my grandfather's great loss of property took away my grandmother's chief ground of opposition. In those days valentines were not, as they have since become, mere compliments, or else practical jokes, but were written in all seriousness; and, among family papers, I have three written by my father to my mother—all of them acrostics on her name. The verses do not show in my father any marked poetic power, nor are the pictorial decorations by which they are surrounded as artistic as I should have expected, judging from other products of his.

When talking, some years ago, to an old lady of eighty or more, who had known my mother before marriage, the trait especially named was her sweetness. The portrait
wn from an oil-painting taken when she
nty, is not inconsistent with this trait;
believe that it was from the beginning
rly correspondence and friendships implied
nduct throughout later life. Indeed, when
llect a display of unamiability, I cannot
lly patient, it was but rarely that she
tion, and then in a very moderate manner
e, indeed, for her submissiveness invited
trait which injuriously co-operated with
tter absence of tact. Unlike women in
s too simple minded to think of manœuvring;
ally, she attempted it, she showed her cards
way. Benevolent feeling was displayed,
her, but it was less diffused. In him it
rest in the welfare of all he came in contact
it did not show itself so much towards
ons: save, perhaps, in her membership of a
throughout life, and in the active part she
ng up petitions during the Anti-Slavery

Agitation. The subordination-element of religion was more dominant in her than in him, and strongly reinforced the ethical element; so that the sense of duty, doubly rooted, was very powerful. One result was that throughout life she perpetually sacrificed herself unduly, notwithstanding the protests I often made, until she brought on, during her latter years, a state of chronic exhaustion.

Along with these traits went much attention to religious observances. Obviously in her case, acts of worship and the anticipations of a happier future accompanying them, formed a great consolation under the trials of a life which in itself was not enviable. She well illustrated the truth, ever to be remembered, that during a state of the world in which many evils have to be suffered, the belief in compensations to be hereafter received, serves to reconcile men to that which they would otherwise not bear. Habits of thought and feeling continued through n
made organic in her the two dominant id
domestic obligations and the ordinances o
during her last years, when her faculties ha
measure failed, it was pathetic to see th
consciousness oscillated between the two: e
its appropriate part of the day. Facing
drawing from a photograph, taken when she
seventy.

Of my mother's intellect there is nothin
remarked. In letters written to my father d
engagement, there are passages showing gr
and grace of expression. During all those ye
which her mental manifestations were k
circumstances did not favour display of her
and justice was not done to them. There
believing that she had a sound judgment
ordinary affairs—sounder than my father's.
been consequent on an aversion to schemes
which was caused by distressing experiences;



HARRIET SPENCER
née Holmes

as well as her husband, and sundry of his brothers, had variously suffered from speculative courses. An attitude of opposition to enterprise, joined as it would be with the assigning of difficulties and the expression of scepticism, would naturally give the appearance of judicial-mindedness. My own proceedings and plans she always criticised discouragingly, and urged the adoption of some commonplace career. In nearly all cases her advice would have been wise; and it may be that her natural or acquired way of looking at the affairs of life, was really a manifestation of good judgment. She had no interest in nature, and never gathered any scientific ideas from my father or from me, though truths pertaining to this or that division of natural knowledge were frequently matters of conversation. There was, however, precision of thought in simple things, as was shown [illegible]er style, which in later letters as in earlier [illegible]ys clear. She understood what constitutes [illegible]and was not in the habit of running one [illegible]nother, as very many so-called educated [illegible]etimes even men, do. Her reading furnished, [illegible]st test of her intellectual tendencies. Such [illegible] as makes up *Chambers's Journal*, interested [illegible]f popular information alternating with short [illegible]ghout the earlier part of her life she never [illegible]being prevented by her ascetic creed, which [illegible]terdicted pleasurable occupations at large. [illegible]ife I think she read a few, including those of [illegible] No books of travels or history or biography [illegible]at by her; nor any poetry, unless, indeed, [illegible] religious poetry. That she knew some of my [illegible]her indirectly, though I have no recollection [illegible] spoke about them; but my larger works were [illegible]e, attempted, or if attempted were promptly [illegible] incomprehensible. Probably, besides the [illegible]hey presented, the consciousness of their [illegible]rom the beaten track repelled her; for, as

already implied, she was essentially conservative. In this the contrast between her and my father was very strong. While he remained plastic to the end of his life—so plastic that he changed his religious opinions after he was seventy—her mind finished its development by the time she was five and twenty, and thereafter she never modified her views.

Briefly characterized, she was of ordinary intelligence and of high moral nature—a moral nature of which the deficiency was the reverse of that commonly to be observed: she was not sufficiently self-asserting: altruism was too little qualified by egoism. The familiar truth that we fail properly to value the good things we have, and duly appreciate them only when they are gone, is here well illustrated. She was never sufficiently [illegible]ed. Among those aspects of life which in old age in[illegible]e thoughts towards pessimism, a conspicuous one is t[illegible] ing of rewards to merits. Speaking broadl[illegible] be divided into those who deserve *little* a[illegible] those who deserve much and get *little*. belonged to the latter class; and it is a sou[illegible] regret with me that I did not do more inclusion in this class.

PART II.

CHAPTER IV.

CHILDHOOD.

1820—1827. Æt. 1—7.

EARLY in 1819, when my father, William George Spencer, then about 29, married Harriet Holmes my mother, then about 25, he occupied No. 12 Exeter Row, Derby. At that time the house was new; forming one member of a street partially built on one side only; and its small garden was separated by a meadow from the river Derwent, on the other side of which lay the mass of the town. Now, however, swallowed up by increasing suburbs and enveloped in the smoke of factories and foundries, the house ved and dingy.

orn on the 27th of April, 1820. Save a rotests against things in general, such as e by infants on first acquaintance with t mention of me in the family correspond- ne 1, in a passage concerning my baptism. homas, who had recently taken orders, my

the child has been baptized at Church. He has not all. With regard to his being baptized at Church, I of Godfathers and Godmothers, and to the sentiments n, such as saying that the child is now regenerate, &c. have originated the delay. If by baptism is meant voting of the child to God, I object to the baptism of And unless a clergyman could feel himself satisfied in orm except that part 'I baptize thee,' &c. I should not ploy one on the occasion. . . . However there is one

alternative which remains with you to approve; that is for you to perform the ceremony when you visit us in September. The name we call him at present is Frederic, but we are undecided between that and Herbert."

There are subsequent letters discussing choice of name; and on the back of one of them I find, in my father's hand, various combinations which he tried. He was a man guided always by independent judgment rather than by custom; and one of the things he inveighed against was the repetition of family names: holding, as he did quite rightly, that a name being used for the purpose of identification, it is foolish, for the sake of a sentimental fancy, to introduce confusion by repeating the Christian names of parents or other relatives. The final choice of the name Herbert was due to an occurrence of the preceding year. While still at college my uncle had sent, in a letter to my father, a copy of some verses by a recently-deceased young poet named Herbert Knowles.* My uncle's admiration of them was, I believe, shared by my father; and, as I learnt in after years, this led to the choice of the name Herbert for me. But my father's preference was, I suspect, in large measure due to the consideration that being uncommon (for though now not rare it was then very rare) it would be thoroughly distinctive.

Of incidents in childhood my remembra
that secondary form which I suspect t
advanced life—I simply remember that I
There was a little sister Louisa, a yea
died at two years old; and playing with
left faint pictures which long survived.† T
for many years, recollections of getting los
which I had wandered to find the house o

* I never saw them anywhere in print, until I
anthology made by Emerson some few years before hi

† There followed five other children, none of wh
week or ten days. It was one of my misfortunes to h
still greater misfortune to have no sisters.

hom I was attached: the result being that the crier was nt round to find me. My most vivid childish recollection, owever, worth mentioning because of its psychological terest, is that of certain results caused in me by being eft alone for the first time. Everyone was out save he nurse, who had been left in charge of me; and she presently seized the occasion to go out too, locking up the house and leaving me by myself. On one evening every week, which happened to be the evening in question, it was the custom to ring a peal on the bells of the chief church in Derby, All Saints'; and while I was suffering the agonies of this first experience of solitude, its bells were merrily going. The effect was to establish in me so strong an association, that all through the earlier part of my life, and even in adult years, I never heard these bells without a feeling of sadness coming over me.

No. 12 Exeter Row (now No. 27 Exeter Street) remained our abode until I was four years old. Before turning to the subsequent part of my childhood, passed elsewhere, some parenthetic explanations are needed.

arryi g on a school, which my father did for efore his marriage and for some years after, lessons. When he was still a boy he ren of Sir R. Wilmot of Chaddesden d he began later, and continued for each more especially in two families in ne was that of the leading physician, he commenced giving lessons at the age le older than his pupils. Each of these, ad in adult life an element of distinction one of them, Charles, who became an ly acquired fame as the designer of the uilding of 1851, and was knighted. The that of the Mozleys, two members of er years well known—one of them James,

canon of Worcester and author of *Eight Lectures* [illegible] *Miracles*, and several other works; the other of the Thomas, named in the last chapter, author of vario works; to whom should be added Miss Anne Mozle also an author of some mark. And another pupil wa Thomas Rymer Jones, long the Professor of Zoology a King's College, London.

Engaged as my father thus was in private teaching when not in his school, and having in addition the duties of honorary secretary to the Derby Philosophical Society, he eventually overworked himself. In his later life, I have heard him express his astonishment on recollecting what he did when a young man. There was no pressing need for this undue application. Already he had accumulated a good deal; as was shown by the fact that he purchased thirteen small houses belonging to his father-in-law, and had still a considerable amount of spare capital remaining. But he was evidently over-anxious to fulfil his duties to those dependent on him; and the result was a break-down in health which, besides incapacitating him for discharge of these duties (wholly for a time and partially afterwards) made his days during a long [illegible] tively painful, and produced a mental state u[illegible] domestic life. His disorder, beginning wi[illegible] 1821 and getting gradually worse, wit[illegible] provement during his vacations, becam[illegible] grave: a distressing complication of [illegible] ments, being joined with an extreme n[illegible] Answering an invitation from his b[illegible] December 1823, he says:—

"I fear if I should be able to reach your parson[illegible] with my petulance and irritability. I have at times [illegible] over my feelings—they carry me away before I am a[illegible]

I doubt not that had he retained [illegible] early education would have been much b[illegible] for not only did his state of body and [illegible]

om paying as much attention to my intellectual culture as
doubtless wished, but irritability and depression checked
hat geniality of behaviour which fosters the affections and
rings out in children the higher traits of nature. There
re many whose lives would have been happier, had their
arents been more careful about themselves and less anxious
o provide for others.

So profoundly was my father's health finally undermined
hat he was compelled to give up teaching. He took a house
t New Radford near Nottingham, on what was then known
s the Forest Side—a suburb adjacent to a tract of wild
and. Here I spent the remaining part of my childhood.

I have still vivid recollections of the delight of rambling
mong the gorse bushes, which at that early age towered
bove my head. There was a certain charm of adventure
n exploring the narrow turf-covered tracks running hither
nd thither into all their nooks, and now and then coming
ut in unexpected places, or being stopped by a deep
andy chasm made by carts going to the sand-pits. Then
re the blue-bells to be picked from among the
which were here and there flecked with
left by passing sheep. In adult life it
recall even faintly that more imposing
rld has to children, caused by the relative
s and the greater proximity of the eyes to
nd.

ved me to pass the greater part of this
ordinary lesson-learning. I believe he
not constitutionally strong. My mother
as a child; and possibly joining that fact
tions, he concluded that I ought not to be
liscipline at an early age: his own break-
m overwork, doubtless tending to increase
robably had then, as ever afterwards, a
e-learning; which accounts, I believe, for

much which he ascribes to other causes. Among his pap
are some memoranda, made, however, late in life, written n
very legibly or coherently, concerning these early da
Here are some extracts:—

"One day when a very little child, I noticed as he was sitting quietly by the fire side, a sudden titter. On saying Herbert what are you laughing at, he said 'I was thinking how it would have been if there had been nothing besides myself."

I do not know that there was anything special in this; for intelligent children soon begin to puzzle themselves and their seniors by ontological questions. The following extract I give only because it indicates my father's general ideas of early education.

"In teaching him his letters, which I began to do when about 4 years old by beginning with the capitals and cutting them out in paper for him, although he learned a certain number of them with ease, perceiving he did not ask to learn any more, nor even to renew his knowledge of those he had learned, I ceased to invite him."

Of course it resulted that I was very much behind most children. An unpleasant proof still survives in my memory. A daughter of a friend of my father, considerably my junior, who had learned to read, was held up to me p
ingly as an example.

My father's compulsory abandonme
migration to Nottingham, were sim
entrance into the lace-manufacture.
lace by machinery was at that time
profits were being made, and a mania re
by letters that, along with two of his
before leaving Derby, bought lace-m
Nottingham was the seat of the new in
prise was probably influential in determ
to Forest Side, which was, however, re
salubrity. Like many others who were
capital in the business, my father did
the general economic principle, that t

rsons into a highly-profitable occupation, invariably ngs about a reaction—a depression equivalent to the evious exaltation, and a consequent loss to the sanguine. he reaction set in soon after he joined in the anufacture. The production of lace became excessive; he profits fell very greatly; and he eventually lost a considerable sum.

Having during three years' residence at Forest Side partially recovered his health, and being obliged by this depressed condition of the lace-manufacture to change his course, my father recommenced teaching at Derby: going for a time backwards and forwards. His health did not permit him to resume his school; and he had then, and always thereafter, to content himself with giving private lessons. By and bye, his engagements growing more numerous, he gave up the house at Forest Side and returned to Derby. This occurred when I was a little over seven years old.

CHAPTER V.

BOYHOOD.

1827—33. Æt. 7—13.

The house taken by my father on his return to Derby in 1827—the house in which he continued to live during the rest of his life, and which remained nominally my home until my mother's death in 1867,—was No. 8 Wilmot Street: re-numbered 17, and finally 31. At that time its neighbourhood differed widely from that now existing. It was one of a newly-built row, forming but a fragment of one side of Wilmot Street. Opposite was a large unoccupied space over which the town was seen; and behind stretched fields, instead of the streets and detached villas which now cover the surface. Not only the immediate surroundings are transformed, but also the region further away, where my boyish excursions were made, has had its rural beauty changed into the ugliness of a manufacturing suburb. Places where I gathered flowers and gazed with interest at the catkins of the hazel, have now become places covered with iron-works, where steam hammers make their perpetual thuds, and through which railway-sidings everywhere ramify. Quiet lanes in which, during early boyhood, I went with a companion trying to catch minnows with a hand-net in a clear little stream running by the hedge, have been transformed into straight roads between land-allotments, with scattered houses built by artizans. And where I picked blackberries, factories now stand.

My life as a boy continued for some time to be compara-

ely unrestrained: school-drill being almost nominal, and very effectual control being exercised over me in other spects. My father, I suspect, still thought that my alth would not bear much intellectual strain; and efrained from pressing me. There was a garden of some size behind the house containing fruit trees, and permitting a certain amount of floriculture; and my father rented an additional piece of land close by as a vegetable-garden. Not unfrequently I had to join in gardening—more frequently, indeed, than I liked. Often when I ought to have been busy at some task which my father had set me, I was otherwise occupied—throwing stones at the birds that settled on the walls and hedges; observing the bees on the kidney-bean-flowers, piercing the base of each corolla to reach the honey; or, at a disused pump-trough containing stagnant water, watching the larvæ of the gnats as they came wriggling to the surface, putting out their tails to breathe, and then descending. Most children are instinctively naturalists, and were they encouraged would readily pass from careless observations to careful and deliberate ones. My father was wise in such matters; and I was not simply allowed but encouraged to enter on natural history.

The majority of my activities, however, were those of the ordinary school-boy, who, on Saturday afternoons and the like occasions of leisure, is commonly given to country rambles and the search for hedge-side treasures. During my early years the neighbouring regions of Osmaston and Normanton, were explored by me in all their details: every hedge becoming known in the course of expeditions, now in the spring seeking birds' nests, now gathering violets or dog-roses, and later in the year collecting sometimes mushrooms, sometimes blackberries, sometimes hips and haws, crab-apples and other wild products. Beyond the pleasurable exercise and the gratification to my love of adventure, there was gained during these excursions much miscellaneous knowledge of things, and the perceptions

were beneficially disciplined. Of all the occupatio however, to which holidays were devoted, I delighted m in fishing. There was the river Derwent, at that time i the black, dirty stream it is now, but tolerably clear a containing a fair supply of various fish; and there we the canals, which on the whole served better for boys' fishing. Many happy half-days, and, during the mid-summer holidays, many whole days, were spent on their banks. Along with such exercise of skill as fishing itself implies, there came the exercise of skill in making fishing tackle; for I was not so amply furnished with pocket-money that I could buy all the appliances I required. I was, I suspect, led by my father in that case as in other cases, to use my own powers of manipulation for satisfying my needs. I made my own floats, and also "hair-tackles," as they were locally called—each some six feet of the line next the hook, made of single horse-hair instead of silk-worm gut. I remember I was cautious and systematic enough to use a test weight before trusting any one of them.

A friendship formed by my father conduced greatly to gratification of this love of fishing, as well as to other gratifications. In the retired village of Ingleby, about seven miles from Derby, had lived, in a preceding generation, a wealthy farmer named Ordish, whose sons had, during their early days, notwithstanding the great difficulties which at that time stood in the way, acquired a little scientific knowledge—a family of youths who, after their day's work on the farm, would walk over to Derby to a lecture (then a rare thing) and walk back again. The eldest of these sons, Edward, was at the time I refer to, the tenant of the paternal farm. He was full of ingenuities: having introduced modified forms of farming tools, all scientific in their conception; and among other original devices had a string from his bed-side to the house-clock, by pulling which he made the clock repeat the last hour struck. The incident which made him known to my father,

was that he had in some way preserved the amnion of a calf in a state of tolerable completeness, and after having, I suppose, united the edges of the ruptured part, had inflated it with hydrogen: the result being that it was capable of carrying up a penknife. He brought over this novel balloon to exhibit to the members of the Derby Philosophical Society. When my father was taken ill, Mr. Ordish invited him to stay at Ingleby; and this led to frequent intercourse. Immense pleasures were brought to me by parts of my midsummer and Christmas holidays spent there. To a town-bred boy a farm-house and its surroundings afford intense enjoyment by presenting many novelties of kinds appealing to his various tastes:—animals, gardens, orchards, implements, hay-making. Much gratification, too, was yielded to my love for natural beauty. Some wooded precipitous ground a quarter of a mile away, called Gill's Hill, and a romantic place further off called Anchor-church, reputed to be an ancient hermitage cut out of the rock, impressed me much. And then there were the quiet picturesque groves of Knowle Hills, which are ever brought back to me by the note of a certain bird which I heard there for the first time. But above all there was the adjacent river. Ingleby is on the banks of the Trent; and between the water and Mr. Ordish's orchard was scarcely a stone's throw. There during my visits, was afforded the delight of unlimited fishing. This I pursued with ardour during the long summer days. In a letter my mother referring to [illegible] enthusiasm I displayed says:—"I understand he was up by four o'clock in the morning;" and I did not cease in the evening till I could no longer see.

When I was something like nine or ten years old, the love of this sport led very nearly to loss of life. I fell into deep water in the Derwent and was close upon drowning. It is a curious fact that whereas dreams are, while in progress, regarded as real, the reality was in this case taken for a dream. During the first part of my immersion

I thought to myself—"Oh, it is all a dream!"; and only after coming to the surface once or twice discovered that I was actually in the water. A youth of some sixteen or seventeen plunged in and rescued me. His name was George Holme. He was at that time a mill-manager. As may be inferred from the fact that he was the one out of a considerable number of spectators who risked himself to save me, he was of superior nature morally; and he turned out in after life to be also a man of much faculty. Gradually rising he became a wealthy manufacturer; and was led, by the development of his business, to establish trade-connexions in various parts of the world—one being pushed even into Central Asia. When sixty he became mayor of Derby and magistrate. He had in a high degree that which another friend of mine describes as the business instinct,—an instinct which experience tells him is quite special, and may or may not accompany other superiorities.

Of out-door activities there was one, indirectly referred to already, which partook of an intellectual character—I mean the pursuit of entomology. Incidentally, and without any form of teaching, my father led me into this. A considerable number of the more conspicuous lepidoptera, common around Derby, I reared from their caterpillar stages to their final transformations. Hence arose a great and continual gratification. Saturday afternoons and other times were spent in exploring banks, hedges, and trees, in search of larvæ; and I made in course of time a considerable collection of moths, butterflies, dragon-flies, beetles. So enthusiastic was I that at one time I sallied out at six o'clock in the morning in pursuit of these natural history treasures. My father encouraged me to make drawings of the insects I caught or reared: there being, under these circumstances, an extra incentive arising from the fact that the objects represented were of my own acquisition. In some cases I added descriptions of them. There still exists among the early products preserved by

my father, a curious example. Having made a drawing on a small piece of paper, leaving no space for writing, I have, I see, stitched to it another piece with an account of what seemed to me a remarkable anomaly—namely that a moth coming out of a chrysalis I had kept, had no wings: the fact being, I suppose, that it was a female naturally wingless or with rudimentary wings. Butterflies are very good objects for first drawing lessons; since they present little more than colours on a flat surface, and thus differ comparatively little from copies. Moreover the process of making outlines is brief in comparison with the process of colouring, which is the part most delightful to children.

Initiated thus naturally, I practised drawing all through boyhood to a greater or less extent: working energetically for a time; then tiring and abandoning it; then after an interval discovering on resuming it how much better I drew than before: one of those effects of the normal spontaneous development of the nervous system in progressing towards its adult structure, which is too much ignored in interpreting psychological phenomena. I may add that my father disapproved wholly of drawing from copies; and such things as were not drawn by me from fancy were drawn from nature. After a time, when my skill had sufficiently increased, I commenced making sketches out of doors. There was in the house a sketching-apparatus in the shape of a walking-stick camp-stool, on which a board could be mounted; and this I was allowed to use. I remember how proudly I sallied out with it to make my first sketch. At the same time, half as amusement half as culture, I was induced to make models. One I remember was of a castellated ruin formed of bits of cork glued together and sanded over; and another was a small chair. These occupations, however, were not pursued with much perseverance.

Turning to more purely intellectual amusements, I may

here name the fact that I was in boyhood extremely prone to castle-building—a habit which continued throughout youth and into mature life: finally passing, I suppose, into the dwelling on schemes more or less practicable. In early days the habit was such that on going to bed, it was a source of satisfaction to me to think I should be able to lie for a length of time and dwell on the fancies which at the time occupied me; and frequently next morning, on awaking, I was vexed with myself because I had gone to sleep before I had revelled in my imaginations as much as I had intended. Often these dreams, becoming literally day-dreams, quite filled my consciousness when walking. Even in the streets my state of abstraction was such that I occasionally talked aloud as I went along: a fact of which I was from time to time made aware by people who turned to look at me. But the strangest instance exhibiting such absorption was this. I had been sent into the town on some commission; got as usual into a train of imaginary adventures; walked through the main streets and suburbs into the country on the other side of the town; eventually came to myself and remembered what I had been sent out for; turned round and walked back through the town; and arrived at the door of our house before again coming to myself and again recalling my errand. I believe it is a general belief that castle-building is detrimental; but I am by no means sure that this is so. In moderation I regard it as beneficial. It is a play of the constructive imagination, and without constructive imagination there can be no high achievement. I believe that the love I then had for it arose from the spontaneous activity of powers which in future life became instrumental to higher things. And here let me remark in passing on an accompanying trait. The tendency to absorption above illustrated, was, I suspect, a part cause of a peculiarity with which my father often reproached me in the words—"As usual, Herbert, thinking only of one thing at a time." This liability to become so engrossed in one

subject, or aspect of a subject, as to quite forget others, led in after-life to sundry disasters.

Along with this passion for castle-building may naturally be named the reading of fiction. As already said, I was not early forced to learn lessons; and the result of this absence of pressure was that I did not read tolerably until I was over seven years old. The first book which prompted me to read of my own accord was *Sandford and Merton*. Once having got over the difficulties I believe I went on with considerable zest, and needed no further stimulus. There were restrictions in certain directions; for my father did not approve of fiction. His ascetic bringing up had, I think, warped his judgment in this respect; and I knew nothing in early days of those stories with which children commonly become familiar. Besides looking coldly on works of imagination in general (not however on poetry) he was critical regarding the moral implications of children's stories: disapproving of the tacit teaching contained in many of them. I was allowed few nursery books, and those only when he had been through them and effectually erased those parts the tendency of which he did not approve. Later, when the taste for novels arose, I had to gratify it by stealth. My mother was even more averse than he was to literature of this kind; and though novel-reading was not positively forbidden, there were impediments in the way of it. But having once experienced its pleasures, my appetite for it became great; and there was a time when such occasional pence as I could spare went to a circulating library stocked with old romances, such as *The Castle of Otranto*, the stories of Mrs. Radcliffe, and the like. These were read in secret, sometimes with a companion. Presently I began to read in bed; and in summer often went on till the birds were singing in the morning. After a time this transgression was discovered, and my mother adopted the precaution of coming to my room to see whether the candle was out.

But I was not thus to be balked of my midnight gratification, and soon out-manœuvred her. Close to my bed-side was a fixed corner cupboard; and habitually, when I heard her step on the stairs, I leaped out of bed, put the candle still burning into this cupboard, got into bed again and pretended to be asleep, until she, thinking all was as it should be, retired. Whereupon I brought out the candle and resumed my reading. There still, I suppose, exist, or at least there did exist up to 1867, a number of black marks made on the under side of one of the shelves of this cupboard by candle flames during these intervals. This must have been when I was about eleven or twelve.

From this account of my surroundings and amusements in boyhood, and this delineation of certain implied traits, I may pass to what has to be said more specifically concerning my nature at that time—physical, moral, and intellectual.

As I had not been injudiciously pressed or considerably taxed during childhood and afterwards, my health was, or had become, quite satisfactory. I can recall nothing more than a few days' illness from one of the disorders of childhood; and on the whole my vigour, though not great, was considerable. There seemed to be then, and continued thereafter, a constitution distinguished rather by good balance than by great vital activity. No spontaneous overflow of energy was exhibited—no high pressure of steam; and hence a certain reluctance to exertion in the absence of a strong motive. Nevertheless there was a large margin of latent power—a good deal of "bottom" as the sporting people call it. In feats of strength I do not remember any superiority except in running. I was more fleet than any of my school-fellows. This may have been associated with an unusual length of limb, by which in boyhood I was characterized. It seems not improbable that this physical trait had something to do with the performance of

a great feat in walking during later boyhood, which will be narrated presently.

Respecting those emotional characteristics directly associated with the physical, I may note that on the whole I was decidedly peaceful. This may have been in part due to the trait which I inherited from my father—a great intolerance of painful feelings, either physical or moral. Natures differ much in respect to endurance, as we see on comparing savage and civilized. The callousness shown by some of the uncivilized astonishes travellers who witness it; and obviously the degree of sensitiveness makes a difference in the degree of readiness with which pain is borne or with which pain is risked. It may have been that as a boy my peaceableness was in part due to a reluctance to enter into combats which entailed evil of this kind. This was not a uniform trait however. When sufficiently aroused by anger, no considerations of pain or danger or anything else restrained me.

Perhaps the most marked moral trait, and that which ran through a variety of manifestations in boyhood and afterwards, was the disregard of authority. Of course one consequence was chronic disobedience. This was a cause of grief to my mother and of reprobation by my father; and as, ordinarily, it did not bring on me such consequences as follow in most cases, it continued notwithstanding perpetual scoldings. The mental nature thus displayed was, I see, commented upon by my father. He says of me in the memoranda which he made late in life:—"As a boy his aversion to any conduct that to him seemed to partake of tyranny was excessive." A concomitant of this trait was, that while greatly averse to anything like subordination to bigger boys, I was averse to exercising power over smaller boys: my tendency to assert my own freedom going along with sympathy for a like freedom in others. And the result was that while I avoided all companionship which subjected me to bullying, I was a

favourite with those who either could not, or did not, bully. Though occasionally, but not frequently, made angry in the course of boyish sports, my anger was never persistent. This trait was once oddly exemplified. Having been enraged by a companion considerably my inferior in strength, who called names after me, I threatened him with vengeance when I should succeed in catching him. After an interval the time came when he was in my power. I then found myself not angry enough to wreak the threatened vengeance; and I actually felt vexed because I had lost the desire to thrash him.

It must not be inferred from statements made above about my fondness for fishing, that I tended towards cruelty. As compared with most boys I was kind to animals—never teased domestic creatures and could not bear to see them teased. And although I was given to the boyish practice of throwing stones at birds under the promptings of that love of sport in which triumph of skill constitutes the chief pleasure, yet in all cases where there was a manifest infliction of pain without the element of skill, I not only refrained, but protested against the doings of my companions: always opposing the gratuitous injury of creatures around, as in the torturing of insects for purposes of amusement. Once a companion took me to see an ox killed; but when, having watched the preparations, I perceived the catastrophe approaching, I fled. Though I had not much compunction in killing a fish I had caught, witnessing the death of a large animal was too much for me. It is curious to what an extent the presence of that emotional gratification accompanying successful achievement, shuts out the sympathies for creatures which may be hurt or slain in the process. Very often one is shown that those who are in all other relations kind-hearted, nevertheless sacrifice animals in the course of their amusements with little compunction. In my own case sympathy did, in

later years, put a check on my love of fishing; and caused desistance for a long period.

Concerning intellectual traits as displayed at this age, I may remark that then, as always, my memory was rather below par than above, in respect both of quickness and permanence. I have frequently heard goodness of memory ascribed to me; but my memory could never have been good, save in respect to certain classes of things. Of all the novels I read in boyhood and youth, the greater part have been absolutely forgotten; and of the rest there are but the faintest traces. It has often excited my wonder to hear others recall the incidents and personages of stories they read in early life; and I have been astonished at the readiness with which they could quote passages from this or that book or poem. A related fact is that throughout boyhood, as in after life, I could not bear prolonged reading. Probably there then existed as there existed later, an early-reached limit to the receptivity. It was as though my intellectual digestive system was comparatively small, and would not take in heavy meals. Possibly also the tendency then, as afterwards, towards independent thought, was relatively so dominant that I soon became impatient of the process of taking in the ideas set before me. Novels and books of travel being excepted, I never read continuously for more than an hour or two. While, however, averse to lesson-learning and the acquisition of knowledge after the ordinary routine methods, I was not slow in miscellaneous acquisition. General information was picked up by me with considerable facility.

Passing now from this brief outline of my character, physical, moral, and intellectual, as exhibited between the ages of seven and thirteen, let me say something about the kind of treatment to which I was subjected.

That disobedience which I have described as being

frequent, naturally led to a state of chronic antagonism. My misdemeanours did not bring direct punishments, but commonly brought only reproofs. Hence I was, I suppose, often encouraged to transgress by the expectation of either escaping altogether, or suffering no greater evil than hard words. My father, unfortunately, while disapproving of corporal punishment, did not adequately use a higher kind of discipline. But for his feeble health and lack of energy after he had fulfilled his daily engagements, the state of things might have been very different. As it happened, I was neither forced into conformity nor led into it by moral means. Continual reprobation for disobedience established a certain kind of alienation; or at least absence of attachment. Not that there was originally a lack of filial feeling; for I see by a letter of my mother that in early childhood I had a great fondness for my father. But I suspect the irritability and impatience caused by the ill-health which over-application had brought on him, tended to prevent the strengthening of those influences which should have served in place of coercive treatment, and would, I doubt not, have done so. I may add here, as being significant of my father's nature, that frequently in his expostulations he set before me the ambition to become "a useful member of society." This ambition was not much like the ambitions ordinarily set before boys. The desire to be beneficial to others was predominant with my father; and he wished to make me also recognize such a desire as a ruling one. However, as might have been expected, admonitions setting forth achievement of public welfare as a chief aim in life, fell upon inattentive ears: my age being such that I could not then appreciate the nobility of it.

I have named the fact that my father's family, as well as my mother's, were Wesleyans; and during my childhood both parents belonged to the body. It would appear,

however, from the remarks made by Mr. Mozley in his *Reminiscences*, that even in those days my father betrayed an incipient alienation from it. The Wesleyan church discipline was repugnant to a nature such as his; and in the course of my boyhood his repugnance became manifest. I believe that the immediate cause of his final secession, was his frequent contact with the methodist ministers on the occasions of the meetings of the methodist book-committee,—a committee which managed the methodist library. Occasionally he tried to get ordered into their library books which he regarded as really instructive—books of science and others of secular kinds. The aim of the ministers was to increase the number of books of the religious class; and especially those concerning their own sect—lives of preachers and the like. Further, he found that in their priestly capacity they exercised a kind of direction over other members of the committee who belonged to their congregations. This he resented more and more. Meanwhile, partly perhaps as an effect of his resentment, he had been inquiring into the system of the Society of Friends: the absence of any priesthood among them being, I suspect, the prompting motive. The result was that he fell into the habit of going every Sunday morning to the Quakers' meeting house. Not that he ever adopted any of their peculiarities, nor, so far as I know, any of their special views; but the system was congruous to his nature in respect of its complete individualism and absence of ecclesiastical government. He went there simply for an hour's quiet reflexion. This change had a curious result. Not wishing to assume that absolute power over me which should ignore my mother's claim, there resulted a compromise; so that from about ten years of age to thirteen I habitually on Sunday morning went with him to the Friends' Meeting House and in the evening with my mother to the Methodist Chapel. I do not know that any

marked effect on me followed; further, perhaps, than that the alternation tended to enlarge my views by presenting me with differences of opinion and usage.

It remains to give an account of the intellectual culture I received during boyhood. My father being unable personally to conduct my education, I was sent to a day-school—the first selected being that of Mr. Mather. He was a very ordinary mechanical kind of teacher, who had no power of interesting his pupils in what they were taught. In repeating lessons I was habitually inefficient. Without saying that I never said a lesson correctly, I may say with certainty that if ever I did, it was very rarely. In ordinary cases punishment would have followed the degree of carelessness displayed by me; but I think punishment must have been interdicted by my father; both because he disapproved of it in itself and also because he did not wish that I should be over-taxed. Among his memoranda occurs the remark:—"He was exceedingly unwilling to learn the Latin grammar, and with some trouble we found the objection to consist in its want of system." This may have been in some measure true; but I think the fact was due in larger measure to my general aversion to rote-learning, and also in some degree to my vague dislike of the dogmatic form. The mere authoritative statement that so-and-so is so-and-so, made without evidence or intelligible reason, seems to have been from the outset constitutionally repugnant to me.

When ten, that is in 1830, I ceased to go to the school above named, because teaching was resumed by my uncle William.* He had inherited my grandfather's school; and carried it on for some years until his health broke down.

* If he remembers that my father's name was William George Spencer, the reader will be puzzled by the fact that I had an uncle named William Spencer. What fancy had led to the repetition of the name William, I do not know. My father was invariably called George.

After his recovery it was revived; and I was one of a select number of pupils. His teaching, partly in consequence of his own superiority and partly I think in consequence of my father's suggestions, was relatively good, and led to some progress. Among other unusual exercises for boys in a school, drawing from objects was one: the chairs and tables around, and other such things, being utilized. We were also led by direct methods to conceptions of the mechanical powers. From time to time we tried experiments with pulleys and levers, and so gained by practice an acquaintance with their properties. At the same time general notions were given of the causes of these properties. I still recall one of the propositions frequently repeated by my uncle William on these occasions—"What is gained in power is lost in time." In all matters appealing to reason I was tolerably quick; and as I learnt in later days from one of my school-companions, though I had not been aware of the fact, was regarded as the leader of the school in such matters.

There was, I think, in this education comparatively little lesson-learning; and, as a consequence, I was not in continual disgrace. A certain amount of the Greek Testament was gone through by us after the natural manner: there being no preliminary discipline in grammar. One of the methods of teaching adopted by my uncle, I suspect at my father's suggestion, was that of requiring us to make maps from memory—at that time, I fancy, a very exceptional method; and in this I acquired unusual skill. I had in early days a somewhat remarkable perception of locality and the relations of position generally, which in later life disappeared. It was then so great that I look with astonishment at some of these maps thus drawn.

My miscellaneous intellectual training apart from school discipline was favourable. I was a frequent listener to discussions. My uncles or others who came to our house always got into conversations with my father of more or

less instructive kinds; now on politics, now on religion, now on scientific matters, now on questions of right and wrong. Good opportunities occurred of obtaining familiarity with certain orders of scientific truths. My father had an electrical machine and an air-pump; and from time to time classes of his pupils came to see pneumatic and electric phenomena. I had frequently to make preparations for the experiments and aid in performance of them. The result was that being on many occasions witness to the facts, and hearing the explanations given, I early gained some knowledge of physics. Incidentally, too, I was led into chemistry. One of my duties in preparing for these lectures, was that of making hydrogen to fill an electrical pistol. The required process had its sequence; for from the solution of sulphate of iron formed in the act of obtaining hydrogen from iron filings, I was in the habit of producing afterwards the crystals of that salt. These by their beauty were attractive; and I sometimes repeated the experiment from mere love of seeing the result. This led the way to crystallizations of other salts, and eventually to other chemical experiments. Much damage was done by letting fall drops of acid upon my clothes; and occasionally the furniture was somewhat the worse in consequence of my awkwardness. But, as my father well knew, these were small evils compared with the value of the knowledge gathered and the facility of manipulation acquired; and he would not have my doings interdicted. Little by little I became much interested in chemistry at large, and read with interest a small book by an itinerant lecturer named Murray, who at that time occasionally came to Derby—a very incompetent man, but one who served to make familiar the simpler truths.*

* I say he was incompetent; being led to say so partly by an anecdote my father told respecting him. On one occasion, when lecturing before the Philosophical Society of Derby, he exhibited the properties of the then-recently-discovered chloride of nitrogen, or, as it was called, the "detonating oil of M. Dulong." After expatiating upon its terrific force, he was about to

Naturally along with this kind of general discipline, and along with the tendency to independent thinking, there came considerable aptitude for interpreting things. This I am led to remark because on one occasion my father put to me some question concerning the cause of an occurrence named; and when, after a pause, I gave him my explanation, his reply was—"Yes, people who knew nothing about it would think that clever; but it is not true." The power thus exemplified of forming a probable hypothesis from the *ensemble* of the evidence, is of course a power which, with inadequate evidence, leads to erroneous conclusions; but it is the same power which, with adequate evidence, leads to correct conclusions.

Along with the advantages of miscellaneous intellectual discipline, there were advantages derived from a miscellaneous supply of literature. My father was honorary secretary to the Derby Philosophical Society,—a society which had been founded by Dr. Darwin a generation before, and was in my father's time fostered by William Strutt, the father of the late Lord Belper. It consisted of the most cultured men of the town, chiefly medical; and besides a library which it accumulated, mainly of scientific books, it took in a number of scientific periodicals. These were circulated among the score or so of members constituting the society. Beyond occasional works of popular kinds, such as books of travel, there came works of graver kinds; and there came habitually the *Lancet*, the *British and Foreign Medical Review*, and the *Medico-Chirurgical Review*: at that time two separate quarterly medical journals, both now dead. Being a member of the committee of the Methodist library; my father also received the several periodicals taken

explode a drop placed in a saucer upon a chair, when some member of the society interposed with the suggestion that if its force was so great it might probably damage the chair. To which Mr. Murray rejoined that there was no such danger, since it was a remarkable peculiarity of the compound that it expended all its force upwards. Whereupon he proceeded with the experiment and the explosion blew the chair-bottom out.

in by it—the *Athenæum*, the *Mechanics' Magazine*, *Chambers's Journal*, and some others. These various periodicals were lying about the house from week to week, and were more or less utilized by me. The greater part of their contents I skipped, but read here and there on all kinds of topics,—mechanical, physical, medical, anatomical, and so forth. I had the use of the Philosophical Society's Library and the Methodist Library. Moreover there was founded in those days a literary institution after the type of that which Dr. Birkbeck had established—an institution which, besides furnishing lectures, formed a library. My father allowed me to subscribe; and I had from it many books which I could not get elsewhere. Sundry of them were historical. How it happened that I had then an appetite for history I do not know. The epical interest is dominant in early stages, alike of the individual and of the race; and I had then more liking for personal narratives and accounts of striking events, for details of battles and sieges, than afterwards remained with me. I read the whole of Rollin's *Ancient History*; and at the same time, or if not I cannot recollect when, I read Gibbon. None but the vaguest ideas of the contents of these books survive.

Here let me sum up the results of my education thus far—that is, to the age of thirteen.

I knew nothing worth mentioning of Latin or Greek: my acquaintance with Latin being limited to ability to repeat very imperfectly the declensions and a part only of the conjugations (for I never got all through them); and my acquaintance with Greek being such only as was acquired in the course of word for word translation, under my uncle William's guidance, of the first few chapters of the Greek Testament. Moreover I was wholly uninstructed in English—using the name in its technical sense: not a word of English grammar had been learned by me, not a lesson in composition. I had merely the ordinary know-

ledge of arithmetic; and, beyond that, no knowledge of mathematics. Of English history nothing; of ancient history a little; of ancient literature in translation nothing; of biography nothing. Concerning things around, however, and their properties, I knew a good deal more than is known by most boys. My conceptions of physical principles and processes had considerable clearness; and I had a fair acquaintance with sundry special phenomena in physics and chemistry. I had also acquired, both by personal observation and by reading, some knowledge of animal life, and especially of insect life; but no knowledge of botany, either popular or systematic. By miscellaneous reading a little mechanical, medical, anatomical, and physiological information had been gained; as also a good deal of information about the various parts of the world and their inhabitants. Such were the acquisitions which formed a set-off against the ignorance of those things commonly learned by boys.

Something remains to be named, however. I refer to the benefit derived from an unusual mental discipline. My father's method, as already intimated, was that of self-help carried out in all directions. Beyond such self-help as I have already exemplified, there was always a prompting to intellectual self-help. A constant question with him was,—"I wonder what is the cause of so-and-so;" or again, putting it directly to me,—"Can you tell the cause of this?" Always the tendency in himself, and the tendency strengthened in me, was to regard everything as naturally caused; and I doubt not that while the notion of causation was thus rendered much more definite in me than in most of my age, there was established a habit of seeking for causes, as well as a tacit belief in the universality of causation. Along with this there went absence of all suggestion of the miraculous. I do not remember my father ever referring to anything as explicable by supernatural agency. I presume from other

evidence that he must at that time have still accepted the current belief in miracles; but I never perceived any trace of it in his conversation. Certainly, his remarks about the surrounding world gave no sign of any other thought than that of uniform natural law.

Let me add that there was on his part no appeal to authority as a reason for accepting a belief. That same independence of judgment which he had himself, he tended, alike intentionally and unintentionally, to foster in others; and in me he did it very effectually, whether with purpose or not. Doubtless it existed innately; but his discipline strengthened it.

CHAPTER VI.

A JOURNEY AND A FLIGHT.

1833. Æt. 13.

Towards the end of June 1833, shortly after I was 13, my father and mother and I started from Derby to pay a visit to my uncle Thomas, at Hinton Charterhouse near Bath. I have no recollection of the first half-day's journey to Birmingham, save a shadowy notion of passing through Lichfield; but the next day's journey left vivid impressions. There is no day in my life concerning which I remember so much.

First among my recollections comes that of the suburban villas as we left Birmingham, and the delusive belief raised in me that life passed in them must be very delightful. I recollect next our ascent of the Lickey hill, and getting off the coach to walk. Then came the picturesque old town of Bromsgrove, full of half-wooden houses, where it was market-day; and shortly afterwards Droitwich, a somewhat similar town, distinguished, however, by its steaming salt works. Meanwhile the Malvern Hills had come into view, and were intensely interesting to me as being the first objects in the nature of mountains I had ever seen; for though born in Derbyshire I had never been in its picturesque parts. Presently we arrived at Worcester, clean and cheerful, where for the first time I tasted cyder: Derbyshire not being a cyder-producing county. By and bye Tewkesbury was reached, with its one long street into which I remember the coach turning

as we passed over the Avon bridge; and then afterwards Cheltenham, so bright and elegant compared with such towns as I had seen. The coach-dinner was there, and we had time to look round. Now came the ascent of the Cotswolds; and I recall my father's comments on the local pronunciation, as the horses walked up the Leckhampton Hill. Presently passing through Painswick we reached the vale of Stroud, charmingly picturesque, and enchanting me by its entire novelty of character. After that, re-ascending the high table-lands, we came to Petty-france, followed by the long bare road to Cold Ashton; whence we descended into Bath, reaching it about 8 in the evening. In these days when I hate travelling, and always choose the train which carries me with greatest speed and fewest stoppages, it is strange to look back on that evening and remember that when we got down from the coach I was *so* sorry the journey had come to an end. Twelve hours perpetual seeing had not satiated me. I was ready for any amount more; and, indeed, I had a little more, for as we drove to Hinton in the twilight, I was constantly leaning over the carriage side and peering down through the deepening shadows into the valleys about Coomb Down.

My first day at Hinton was one of great delight, derived from all the novelties around me—especially the new insect life. A ramble in the neighbouring fields on the bright summer morning, has left an indelible impression caused by the numbers of unfamiliar flowers, butterflies, and moths. Blue butterflies, of which at home in all my rambles I had seen but one, were abundant; and there were numbers of Burnet moths, which were previously unknown to me. Subsequent days with wider excursions brought like pleasures. Not long after our arrival, I discovered a nest of caterpillars of the peacock-butterfly. I had never seen any before, though I knew them perfectly from drawings; and I carried them back in great glee. I

was allowed by my uncle, at my father's instigation, to make preparations for rearing them; and I had already had so much experience that this was an easy and successful process.

A few days brought a revelation which disagreeably astonished me. I had supposed I was about to spend a month's midsummer holidays; but I was taken by my uncle one morning and set down to the first proposition in Euclid. Having no love of school or of books, this caused in me great disgust. However there was no remedy, and I took to the work tolerably well: my faculty lying more in that direction than in the directions of most subjects I had dealt with previously. This was significantly shown before the end of a fortnight; when I had reached, perhaps, the middle of the first book. Having repeated a demonstration after the prescribed manner up to a certain point, I diverged from it; and when my uncle interrupted me, telling me I was wrong, I asked him to wait a moment, and then finished the demonstration in my own way: the substituted reasoning being recognized by him as valid. Nothing further was at that time required of me; unless, indeed, I name reading. My uncle condemned my reading as bad in manner (and he was quite right, for I had then, as ever after, a tendency to hurry, leading to indistinctness of articulation), but he remarked upon my extensive acquaintance with words. This was somewhat strange, considering that I had had no reading lessons. Learning to read, as I have before pointed out, very late, I afterwards gained my knowledge of words by reading all kinds of books, and hearing the conversations around me.

After some four weeks, during which my daily lessons were occasionally interrupted by excursions made on behalf of my father and mother as visitors, there came the time for return. Then occurred a revelation still more startling than the first. I found that I was to remain at Hinton. It seems that the arrangement had been made some two

months before. In the family correspondence there is a letter from my uncle to my father, which consults him respecting the desirableness of having at Hinton, his little nephew Henry. The proposal was prompted by sympathy with his brother Henry, the boy's father; who through losses, chiefly in lace-manufacture, had fallen into straightened circumstances. This letter brought from my father, or rather from my mother with his approval, a letter containing a counter-proposal; namely that he, my father, should take charge of Henry and educate him, while I should be taken charge of and educated by my uncle Thomas. This, as shown by a letter of May 13, brought from Hinton a cordial assent, as being an arrangement which my aunt and uncle much preferred.

On finding that I was not to return home, my dismay was great; but there was nothing for it but to submit. Something like ten days passed in the ordinary routine; but in the course of that time there were certain incidents which, apparently trivial, had significant results. Frequent disagreements with my fellow-pupil S—— had occurred. I was at that time, as at all times, argumentative; and whatever we were doing together was apt to lead to points of difference, and occasionally to high words. To remedy the evil my uncle decided that we should study at separate hours: S—— in the morning and I in the afternoon, so that we might be kept apart. This arrangement, put in force about the last day of July, brought my discontent to a climax. I had never before been under anything like so strong a control, and I had also a yearning for home: a home-sick song popular at that time,—"Those Evening Bells,"—being a continual solace to me. I was quite prepared to break out into a rebellious act, and needed only this change which deprived me of companionship to fix my determination. As we were lighting our candles on going up to bed that night, I said to S——, referring to the arrangement of the day,—"It won't happen again."

The next morning revealed my meaning. Rising soon after six I started off; having resolved to return home. Reaching Bath in little more than an hour, and buying a penny roll just before leaving the city on the other side, I took the Cheltenham road; and, as I ascended the long hill and for some time afterwards, kept glancing over my shoulder to see if I was pursued. Presently, getting on to the high broad back of the Cotswold Hills and increasing my distance from Hinton, I ceased to fear that I should see the pony-carriage coming when I turned my head. But now as I walked on under the hot sun, I began fully to perceive my forlorn state; far away from anyone I knew, without possibility of going back, with scarcely any money, and with an immense journey before me. No wonder I burst into tears from time to time as I trudged on. However my speed, judging by the result, was not much diminished by the occasional fits of grief. Pursuing the monotonous road, varied only by here and there a cottage or a toll-gate, I came in the afternoon to the end of the high lands and descended into the Stroud valley; walking through its picturesque scenes in a widely different mood from that in which I had seen them a few weeks before. Reaching Stroud between 5 and 6, I remember asking a man on the other side of the town, which was my way to Cheltenham. He pointed out the way and said —"But you are not going there to-night, are you?" He would have been greatly astonished to hear that I had already walked from five miles on the other side of Bath. To Cheltenham I did go, however: reaching it, I suppose, between 9 and 10 in the evening, and finding a small suburban tavern where I got a bed for sixpence. I had only two shillings pocket money, which I saw I should have to make last me during the journey. On that day and on succeeding days I repeated my occasional purchase of a penny roll: twice or thrice during the journey stopping to get a glass of beer. Bread and water, with perhaps

three glasses of beer, were the only things I tasted between Hinton and Derby.

I could not sleep a wink at Cheltenham. The physical excitement produced by walking 48 miles, kept me tossing about till it was time to rise. Next morning, however, I early started off again, undismayed by my bad night. I got a ride out of Cheltenham for some two miles in a cart; and then resumed my weary walk, seeing from time to time the Malvern Hills, which, when I first caught sight of them the previous evening, had given me a thrill of pleasure as being old friends. Mile after mile was traversed during the sultry August day, along roads thickly covered with dust—through Tewkesbury and Worcester, on to Droitwich and on to Bromsgrove, which I reached and passed in the evening. I intended to walk that night to Birmingham, but an occurrence deterred me. While resting some miles beyond Bromsgrove, I was accosted by one of those wandering Italian image-sellers, common in my boyhood—men who went about carrying on their heads boards covered with plaster casts, and calling out "Finees!" This man sat down by me; and when I walked on he joined me. After a time he pulled out a large pocket-knife with a blade of some eight inches long or so, and spoke of it admiringly. This, as may be imagined, made me shudder. I do not suppose he meant anything; but still his act suggested the thought that he might murder me. Presently we arrived at the little inn on the Lickey called the Rose and Crown, and I asked for a bed. Luckily they let me have one, and to my great delight they would not let the Italian have one. He had to go on.

That night, like the preceding one, was sleepless. The exertion of walking about the same distance as before (for I believe from Cheltenham to the Rose and Crown is 49 miles, and deducting the 2 in the cart leaves 47) had maintained that feverish state of body which always keeps me awake. Next morning after a few miles' walking, I came

up with one of those heavy wagons, common in the days before railways, carrying goods between chief towns—wagons now no longer seen—great lumbering vehicles with large hoods to them. I made friends with the wagoner; and he let me ride on the soft straw as far as Birmingham, where he stopped. Thence I walked on to Lichfield. At Lichfield I happened to be passing the chief hotel just as the Derby coach drew up; and, getting hold of the coachman, told him my story. No doubt he saw in my worn face and parched lips how much I had been suffering. He took pity on me, and, the coach having plenty of room, let me ride for nothing. I asked to ride as far as Burton. When we reached Burton I offered him the few coppers I had left to let me go on. He, good fellow, refused to have them, but allowed me to keep my seat; and so I reached Derby about 3 o'clock in the afternoon of Saturday, having left Hinton on Thursday morning. That day I had walked not more than 20 miles, if so much.

Here, before passing to subsequent incidents, I may remark on the physical effects of this escapade. It can, I think, scarcely be doubted that my system received a detrimental shock. That a boy of 13 should, without any food but bread and water and two or three glasses of beer, and without sleep for two nights, walk 48 miles one day, 47 the next, and some 20 the third, is surprising enough. It is strange that the exertion was borne at all; and it is highly improbable that it was borne without injury. At an age so far short of maturity, a tax so great necessarily tells upon the subsequent development. The cost has to be met somehow; and is met, no doubt, by a falling short of ultimate perfection of structure. However, there was no manifest sign of mischief, either then or during subsequent years.

As may be imagined great consternation was caused at home when I made my appearance. No expectation of

seeing me had arisen, for no letter had arrived. At that time it took two or three days for a letter to go from Hinton to Derby; and some hours had elapsed before information was given at the parsonage which made it clear what had become of me. The following is from my aunt's letter, written not to my father but to my uncle William, announcing my flight:—

"Herbert early this morning left us, and without in the slightest degree considering our feelings; as not any one in the house was aware until several hours afterwards of his having left Hinton. We however heard from a person who met him before 7 o'clock that he was walking exceedingly fast, and making the best of his way to Bath; from whence we have not the least doubt he intended to proceed to Derby. But as he may not arrive at his home for some days yet, we are anxious his parents may not hear of this, that they may be spared the very great anxiety which would be caused by the thought of so young a creature travelling so long a distance, friendless and pennyless! Had there been any cause for this strange conduct we should not have been so much surprised; but nothing in the world has occurred to give him any reason for such a step. He has been treated with the greatest kindness, and has not been in any instance punished: indeed he has been much more indulged than before his Father left us.

"It is my decided opinion that unless his Parents punish him severely, and return him again to us *immediately*, it will not only be *insulting* to us, but *ruinous* to the boy himself!"

Later in order of date, though written on the day of my arrival in Derby, is a letter from my mother to my uncle and aunt, from which the following is an extract:—

"I think no one could picture the astonishment and grief I felt when he walked into the room. His Father was at Coxbench and did not arrive till ten the same evening, and was as you will suppose quite overcome, and was a length of time before he recovered from the tremour it put him into. Poor Herbert is exceedingly distressed. He weeps very much but says he could not help it, the confinement to his own room for so many hours was more than he could bear. He wishes his Uncle to be told how sorry he is to offend him so, but appears to consider that there is no hope of forgiveness whilst he lives. It seems that he wept most of his way home, and from what I can gather his tears appear to have been mixed up with those of penitence. I should think it very likely he will have an illness from walking such a distance with only the support of bread and water. I had given him on the morning I left Hinton two shillings for the purpose of purchasing needles for

his insects and any other little matter he might require. With this sum he reached home."

Then after an interval during which come letters from my aunt and uncle with further comments on my conduct, there occurs a long letter from my father dated August 15; in which, after speaking of my state as such that "a little more excitement would have brought on a brain fever," and after narrating a conversation he had with me, he continues:—

"I fear being tiresome, but I have said thus far, that you may form some idea of the child's feelings. That this desperate step was taken in part from an overweening desire to see home and to enjoy the habits of home and the affections of his parents, I can have no doubt, notwithstanding his silence on the subject whilst with you, might lead to the thought that he had not much regard for either. Believing this as I do, and believing too that his bodily frame was quite in a state of inflammatory action, I confess I durst not think of sending him back immediately; notwithstanding I had shortly after the opinion of our dear Anna that a contrary conduct would be attended with the worst of consequences.

"I might mention in corroberation a journey he once took to Ingleby, a distance of 7 miles, to see me, without his mother's knowledge and when he was only 9 years old, and in the performance of which he ran the greater part of the way. But these feelings are not peculiar to him. You yourself no doubt recollect longing after home so intensely whilst at Nottingham, that although my father to comfort you did what I never knew him to do before or since, go over on purpose to see you, yet so ungovernable were your longings after home, that in defiance of all entreaties you ran after the coach that was taking your father from you, and compelled them by your importunities to take you too. This occurrence has also forcibly brought to my mind the intense feeling you showed when at Quorn on the same subject, and how repeatedly I used to go over to try to comfort you, and to act the part of a father to you. Let us not forget these feelings of our youth, my dear brother. They are dear to my memory, and I invite you to cherish them."

After being more than a fortnight at home, my father thought me sufficiently recovered to return. I was received at Hinton very amicably. No mention was made of the misdemeanour, and things went on as if nothing had happened: my uncle's plan, however, of separating S—— and myself not being repeated.

CHAPTER VII.

YOUTH AT HINTON.

1833—36. Æt. 13—16.

THOUGH Hinton Charterhouse figured in the last chapter, no description was given of its character, surroundings, and society. As a considerable portion of my youth was passed there, something under these heads seems called for.

On the road from Bath to Frome, which is eight miles further, Hinton stands on the top of one of the higher tracts in those regions. Though not itself a picturesque place, it has picturesque places all around. The country is hilly; and distant downs of oolite close in the adjacent valleys. Near at hand, is a beautiful village called Freshford, on the banks of the Avon, which runs through it to Bath and finally to Bristol. This was at that time, and perhaps is now, a place of residence for retired naval and military officers, and kindred people. Among others, the Colonel Napier who wrote the History of the Peninsular War, lived there.

In the village of Hinton Charterhouse itself, the chief place was Hinton House, where resided Mrs. Day, of whom we saw nothing. At one time my uncle visited there, but some coolness had arisen. There was also Hinton Abbey—a gothic building of some age with detached ruins dating from monkish times. It had long been the seat of a family named Humphreys, into which a Captain Simmons married; and his daughter had been married to my aunt's

brother, Mr. Harold Brooke. Hinton Parsonage was situated about a third of a mile from the village on the way towards Bath. It had been built by my uncle with funds which, though added to by himself, were chiefly raised. Ecclesiastically, Hinton had long been an appendage to the neighbouring parish of Norton. Centuries had passed since there had been a resident clergyman. Indeed my uncle was the first since catholic days; and by a strange coincidence, his catholic predecessor bore the same name—Thomas Spencer.

At the time I went to Hinton, my uncle was about 36, and my aunt, I think, about 26. He was a man of energetic, strongly-marked character; and, himself exemplifying the results of successful effort, had a somewhat too unqualified belief that in all cases those who did not succeed had themselves to blame. Thoroughly sincere in his beliefs, he was at the same time much more liberal than most in the construction he put upon the beliefs of others. The honours he took at Cambridge show him to have been intellectually above the average; and he was not without originality of thought. Indeed he exhibited a good deal of this, considering the narrowing discipline he had passed through. Of my aunt, *née* Anna Maria Brooke, I may say that she was a woman of ordinary intelligence and superior moral nature; having much philanthropic feeling, joined with much self-control. She belonged, as did my uncle, to the evangelical school: he, when at Cambridge, having been one of the adherents of Mr. Simeon. She was of Irish-Scotch extraction Her grandfather had been at one time governor of St. Helena; and her father, a military officer in India, had died many years before her marriage.

Not much social intercourse was kept up by my uncle and his wife. He was not a man who made himself attractive in society. Always absorbed in some one topic which at the time interested him (usually connected with public welfare) he was too apt to turn the conversation in

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his own direction; and this trait, joined with absence of taste for the trivial talk of county dinner-parties, put him out of sympathy with most of his neighbours: differences of opinion concerning political and ecclesiastical questions probably aiding. Hence, excepting rare exchanges of calls and dinners with some two or three friends at Freshford, and with connexions at Hinton Abbey, there were no visits save those to my aunt's Anglo-Indian relations in Bath, which were frequent.

My uncle had long been in the habit of taking resident pupils, generally to prepare them for college. The one to whom I have already referred as being there at the time I went to Hinton, was a young Irishman, S——. Unfortunately S—— was not a desirable companion. Though five years my senior, his knowledge and ability were not such as made me feel my inferiority; and hence my natural independence was fostered rather than repressed. Moreover, his disposition was none of the best, and our relations continually tended towards antagonism; so that on the whole, an undesirable effect was produced by the association.

For some time my life now passed in an uneventful way. The daily routine was not a trying one. In the morning Euclid and Latin, in the afternoon commonly gardening, or sometimes, a walk; and in the evening, after a little more study, usually of Algebra I think, came reading, with occasionally chess. I became at that time very fond of chess, and acquired some skill. My aversion to linguistic studies, early shown, still continued. Under date September 29, 1833, my father writes to me—

"Certainly you have a taste for composition, and it would indeed be strange if it should so happen that you should have a distaste for words of which such composition is formed."

And, writing to my uncle on October 28, he says—

"What do you conceive he is the most adapted to? Does he still retain the aversion to Latin that he had? And if he does, how do you account for it? And will it be well to yield to it?"

Very different was my attitude towards mathematics. At

about the same date there is mention of demonstrations made by myself of propositions in the fourth book of Euclid: not, however, approved by my uncle. Of the tendency to independent thinking thus illustrated, a very significant illustration was supplied by a discussion concerning a question in mechanics. In October, one of my letters home refers to the reading aloud of Dr. Arnott's work on Physics (edition of 1833). Among other subjects the book deals with is that of inertia; and a statement respecting it drew forth a demurrer from me. The following must, I think, be the passage containing the doctrine to which I could not assent.

"It is the resistance overcome . . . which is called the INERTIA of the mass, or the *vis inertiæ*, and sometimes to help the conception of the student, the *stubbornness*, *sluggishness*, or *inactivity*; but no one of these words can originally suggest to the mind all that is intended to be conveyed."—Pp. 51-2.

In opposition to this I contended that there could not be a *vis inertiæ*—that inertia was not a positive force. It seemed to me clear that a body could have nothing more than simple passiveness; and that there could not be in it any principle of active resistance, as implied by Arnott's words. My uncle took the view which Arnott appeared to take, in adopting the word *stubbornness* as explanatory; and my constitutional disregard for authority was shown by dissenting from the opinions of both. I can still remember that to illustrate my position, I said that if a man-of-war could be suspended from the heavens, a push against the side of it would move it—of course very little. Naturally my uncle was irritated by my obstinate defence of my belief; in presence, too, of my fellow pupil and my aunt. Certainly it was strange for a boy of thirteen to display such self-confidence. And it was not only morally significant as showing how deep-seated was the tendency to criticize opinions, and to reject those which did not commend themselves; but it was significant intellectually as showing a quick insight into physical truths.

For I was right in my position, notwithstanding the authorities against me.

The trait of character thus displayed was, I see, shortly afterwards displayed in another, and less offensive, way. In a letter to my father dated January 28, 1834, there occurs the passage:—

"I forgot to tell you in my last letter that I had made some problems in Algebra with which my uncle was much pleased, and as I want something to fill up I will tell you them all." [Here follow seven algebraic problems, sundry of which might serve for a beginner.] "My uncle was most pleased with the 5th of these, which the [he] thought was very original."

Correspondence shows that in March, I was learning French grammar, Greek, and Trigonometry. In both the French and the Greek my progress was extremely small; and what little there was was under pressure. With Trigonometry I speak as being delighted: sending my father some solutions of trigonometrical questions. It was at this time, too, that I sent home a sketch of the parsonage, which, inartistic enough, was a tolerably good representation of the house and its surroundings.

A little before this time, the New Poor Law came into operation. Previously, my uncle had always been a pauper's friend: habitually siding with the pauper against the overseer. But the debates during the passage of the bill through Parliament, had opened his eyes; and as soon as it passed he began to apply its provisions to Hinton, before yet the Bath Union was formed (obtaining, I believe, authority from the Poor Law Commissioners with whom he was in communication). His actions in the parish formed daily topics of conversation; so that I was perpetually hearing social questions raised and commented upon.

Euclid was gone through again at this time; and mention is made of the fact that I was able to repeat some of the propositions without the figures: not, as might be

supposed, by rote-learning, but by the process of mentally picturing the figures and their letters, and carrying on the demonstrations from the mental pictures.

The following extracts from letters indicate the results of the year's training, moral and intellectual. Writing to my grandmother on June 9, my uncle says of me:—

"He has not yet attained the power of studying of his own accord, and if he were at home, it is my opinion he would not learn as much in a year as he ought to do in a month."

And on June 20, he writes to my father:—

"At different times during the last few months I should have been rather inconsistent with myself in my opinions of Herbert, had I given them to you. Sometimes I have seen much that was hopeful and at other times much that was discouraging. Of his talents there can be no doubt they are of a very superior order, and when he is under the restraining effect of an observing tutor and all trivial pursuits are banished from his thoughts, then a calm and grave diligence in study and cheerful quickness of intellect distinguish all he does, and one cannot help treating him with an increase of confidence in manner and that kind of commendation at least which evident satisfaction with his conduct shews. But the mischief is that too soon the injurious effects of this are seen by *diminished diligence* and MODESTY. The grand deficiency in Herbert's natural character is in the principle of *Fear*. And it is only so far as his residence with me has supplied that principle in a degree unusual to him, that after a few struggles he entirely surrendered himself to obey me with a promptness & alacrity that would have given you pleasure to witness, & the more obedient I have observed him the more I have refrained from exercising authority. By *Fear*, I mean both that 'Fear of the Lord' which 'is the beginning of wisdom,' and that fear of Parents, Tutors &c."

That the opinions expressed in these extracts were in large measure true, I have no doubt. I was at that time, as always before and ever after, very idle unless under the stimulus of some powerful motive: usually the desire to compass some large end.

Towards the close of June, in company with my uncle, I went to London. Reaching Watford the day after, I there joined my father and mother who were visiting Mr. Charles Fox (afterwards Sir Charles Fox) who had in boyhood been a pupil of my father, and was engaged as sub-engineer under Mr. Robert Stephenson on the London and

Birmingham Railway (the initial part of the London and North Western), then in course of construction. A pleasant fortnight was passed there: one of the pleasures being the novel one of feeling myself an object of parental approval. There was some fishing, too; for I had taken my rod on the strength of the conclusion that the name of the place, Watford, implied a river. Some interesting days were passed in going with Mr. Fox over the line, and among other places into the Watford tunnel, at that time being pierced. Moreover, I made, rather I fancy as a task than from liking, a sketch of Mr. Fox's house in oils: miserable enough artistically but tolerable as a portrait. This, I remember, my father preserved, stuck up in his bedroom for many years; though certainly not because of any decorative value it had.

Another fortnight was spent with friends in London. Along with the ordinary sights seen was one at that time not ordinary—the Zoological Gardens; then a private collection visited only by fellows of the Zoological Society or by those they introduced. One of the fellows, Mr. T. Rymer Jones, afterwards professor at King's College, another of my father's old pupils, took us. Beyond the general impression of the place, then relatively small, I recall only, by an unaccountable freak of memory, a discussion about going to theatres, between Mr. Jones and my father—my father reprobating the practice. He had not at that time outgrown the puritanical bias of the family, as, later in life, he did.

At the close of the holidays I accompanied my parents home to Derby, and there soon verified my uncle's prophecy; as witness the following extract from a letter of his dated August 14, apparently in response to some letter from my father:—

"I am led more particularly to this by the fact that he has learnt only 24 propositions of 6th book in a fortnight, when he knows well he could easily learn the whole book in a week.

Correspondence shows, however, that as some addition to

this small amount of work, I had commenced perspective under my father's instruction. In this case, as in others, he adopted the self-help method of teaching. Having explained what perspective is, using a plate of glass with an object behind it, and showing me the relations of the different elements—point of sight, centre of the picture, horizon, and so forth—he set me to solve each of the successive problems myself. I am not sure when this series of lessons came to an end—whether that year or the next; but I remember that I went through the whole of perspective in this manner.

When I got back to Hinton in October, I found there an additional pupil, Robert P——, a youth of 18 or 19, who had been at Harrow, and came to my uncle for a year before going to India. He had not much more capacity than S——; but was good-humoured. A sentence concerning him in a letter from uncle to my father, may fitly be quoted because of the implications it contains:—

"Anna's cousin Robert P——, is a very agreeable, polite and intelligent young man, so much more gentlemanly than S——, and showing off S—— to such disadvantage, that Anna and I both begin to think the fault was more with S—— than with Herbert whenever they disagreed."

There was now made a discovery which brought me into disgrace, and which, had it been made earlier, would have in great measure negatived the favourable estimate made of me when I went home. An old musket was kept in the house, for safety's sake; and during the previous spring I had fallen into the habit of going with this after small birds about the place, while my uncle and aunt and S—— were at Bath. This went on for months and nothing transpired. In the autumn after my return, S——, who had brought a fowling-piece from home, lent it to me, and I used this instead of the musket. Not only did I thus waste my own time, but I sometimes led into idleness a young fellow employed as groom and gardener, by taking

him with me. Of course when these facts came out, there resulted an explosion; and I was under a cloud for some time.

Letters show that in December I was put under more pressure than previously in respect of the studies I was averse to. Arrangements were made by my father under which I had, before given dates, to send him certain amounts of translations. I continued to be very stupid. On December 8, my uncle writes:—

"Herbert sets himself to work in any difficulty in a very bungling manner; displaying great ignorance of the nature of his own language, as well as the Latin. He never knew much of English Grammar. . . . I find it much more laborious on this account, and also from his very great forgetfulness of his Latin Grammar, even in parts that he has repeated to me."

A letter from him of a previous week contains a passage which I had not expected to find. He says:—

"I think he has got a much better notion of construing Greek. He can only prepare for me a few verses of St. John; but what he does prepare he has very accurately, which is a very important matter."

I am surprised that it was ever possible to say as much even as this, seeing how unteachable I continued always to be. As to my ignorance of English grammar, my uncle's statement might have been properly much stronger. He should have said I knew nothing of English grammar. It was one of the things I was excused from when at school, in consequence of my father's desire that I should not be pressed. My knowledge of it was limited to such few words and phrases as occasionally caught my ears from school-fellows who were saying their lessons; and as the subject was repugnant to me, these made on my mind mere mechanical impressions, the meanings of which I never thought about. The acquaintance I gained under pressure with the Latin, Greek, and French grammars was but small. I never got to the end of the conjugations in any one of them; and as to syntax, not a single rule of any kind was taught me. I believe one cause for my dislike to language learning was that I had an aversion to everything

purely dogmatic. It seemed as though in all matters statements must be put before me under forms comprehensible by reason; or, at any rate, not under the form of mere assertion. Present anything as a rule—No; present it as a principle—Yes. These words will briefly express my indifference and interest in the two cases. The antithesis is exemplified by a fact which I have observed of myself when having to perform calculations. As a boy I was taught the rule of three; but it soon faded from my memory. As a boy, not long after, I was taught the laws of proportion. These I have remembered; and now, whenever an arithmetical operation involving the rule of three has to be performed, I never think of the rule as learnt, but I deduce my rule afresh from the truth that in any proportion the product of the extremes is equal to the product of the means.

Shortly after the dates of the above letters, my uncle visited Derby; and a letter to me from my father then written, contains passages worth quoting:—

"The accounts received (since my dear brother's arrival) of your obedience and desire to oblige, have been highly cheering to our minds; drooping as they occasionally are under your absence, and under the thought of your future prospects in life." . . . "Both your uncle and aunt have noticed, that at certain times, your voice assumes a very unharmonious tone. I have repeatedly observed the same thing myself." . . . "Depend upon it my dear fellow that the maker of us all has so ordained the universe, that a kind state of feeling will be accompanied by a kind tone of voice. And a kind tone of voice is almost synonymous with a musical voice. Look around you through nature, and I shall be much surprised if you don't find the rule general if not universal."

After his return to Hinton my uncle says concerning me, in a letter of Jan. 23:—

"I have made particular enquiries as to his conduct during my absence. I find Anna allowed him the 1st week almost for himself, and particularly observed whether, of his own accord, he would take up his painting or any other subject of self-improvement, but was disappointed to find he in no instance did so. Amusement, and reading Chambers's Journal, were the only occupations." . . . "With this exception of a *main spring* in this machine, all other things go on well. He uses in my absence a little dictatorial manner of speaking to R. P—— I understand; but as far as I see, he has much less

of that fault than he formerly had." . . . "Anything more attentive than his manner to me cannot be imagined; but still this stimulus he cannot always have, and if we can but see some inward principle of action it would be very cheering."

During the spring of 1835 things appear to have gone on smoothly: comments being made upon my diligence. Before the end of May I had been through the eleventh book of Euclid and also through "Lectures on Mechanics" —either Wood's Mechanics, a text-book in my uncle's college days, which I certainly went through at some time, or else the Cambridge Lectures which he had written down, and which we studied from his MS. Referring to these studies, and giving me a problem to solve, my father says in a letter of August 4:—

"Now if you can't answer this and the other questions which I have sent, I shall think that you have not digested well what you have already eaten. And I suppose you will agree with me that without food is well digested, it affords little or no strength, however nice it may have been in the eating. Remember, also, that unless a person takes a deal of exercise they may soon eat more than does them good, although they may have excellent stomachs. In your next apply these illustrations to intellectual pursuits."

I presume that this admonition was not in my case much needed; since, if I had not assimilated the mechanical principles already taught to me, my uncle would not have advanced me to a higher stage, as he had done some days before the above passage was written. In a letter to my father dated July 28, I apologize for breaking off because "I have to learn a quantity of Newton to keep up with the others this morning;" and there occurs the sentence—"But I am very proud of having got into Newton." Reference to the MS. book, which I still possess, shows that I did not go very far; but this it appears was due to the fact that I shortly left Hinton for a time.

About this period we read aloud Miss Martineau's *Tales of Political Economy*. Years before, when at home, I had read sundry of them; and comments to my advantage had been made in consequence. I believe that these were but little deserved, and that I read for the stories and

skipped the political economy. However, from remarks in my letters written in the spring of 1835, it appears that I had gathered something of a solid kind.

In August, 1835, I went home. As before, so again, it resulted that when not subject to my uncle's discipline, I studied but little. There was, however, an additional pursuit, namely Chemistry; my experiments in which are named in letters to Hinton. There is also mention of discussions on physical and moral questions with my father: some of them being raised afresh when writing to my uncle, with a request for his opinion.

I was received back at Hinton very cordially in November. There I found a new comer replacing S——, who had gone home. He also was from Ireland—an Irishman I was going to say; but literally an Irish youth, younger than myself, named F——. He did not raise my conception of the average intelligence; for he had still less faculty than preceding pupils. However, though stupid, he was good-tempered; and that made the exchange advantageous.

A letter written home in December contains a sketch-plan of the house and grounds, not made from measure, but from general inspection and knowledge of the place. It was thought that I could not have done such a thing without a copy; but this was untrue. My perception of locality was at that time somewhat unusual—much greater than in later life. It was one of those powers which sometimes develop early and afterwards sink into the background; as in the cases of boys showing special powers of calculation.

At the close of the year I made my first appearance in print. A small periodical called *The Bath Magazine* had been announced to make its first appearance on January 1, 1836; and my uncle had been invited to contribute. I heard much about the proposed periodical while preliminaries

were being arranged, and my ambition to write for it was aroused. This I did secretly. My contribution was a letter describing the formation of certain curiously-shaped floating crystals which I had observed during the preceeding autumn when crystallizing common salt. The letter appeared in due course to my great delight, and to the surprise of my relations. Once having commenced, of course the ambition was to continue; and a topic then dominant in the conversation at Hinton furnished the subject of a second letter—a reply to a communication antagonistic to the New Poor Law, which had been published in the first number of the magazine. I name the circumstance as showing that, even at that time, there was interest in topics of widely diverse kinds.

My letters to my father continued to contain more or less that was original—sometimes problems which I set him in Geometry or Algebra, and at other times ideas in Mechanics. A passage in one of them dated January 31, 1836, runs as follows:—

"I have just invented an improvement on the air pump, that is, on the manner of working it. If you remember I mentioned to you while I was at home, that I thought it would be a great improvement if we could turn the handle the whole instead of half-way round; because on the present plan you not only stand in a disadvantageous position, but every time you stop the handle, you lose the momentum acquired in going half way round, whereas by my plan in which there are only three more wheels, you may go right round."

Whether I deluded myself or not in supposing my plan practicable, the incident is significant: partly as again showing that which has already been shown in so many ways—the self-reliance which, among other results, prompts original thought—and partly as implying some mechanical ingenuity. Another illustration of this self-reliance is furnished by correspondence at that time. Mention is made of proofs of my uncle's pamphlets read by me for the correction of typographical errors and punctuation; and the mention is accompanied by some criticisms on his style (!)

A propos of these pamphlets, some of which were on the Poor Laws and some on other topics, I may add that my uncle had been recently appointed the first Chairman of the Board of Guardians of the Bath Union. He also took part in the temperance agitation, as well as in other philanthrophic activities; and the correspondence proves that I had a considerable interest in all that went on. The daily discussions constituted a useful discipline, having results in after life.

One of my fellow-pupils, P——, obtained his expected Indian appointment about the close of 1835, and thereafter disappeared from our circle. Our relation had been amicable; and at parting he presented me with all his fishing gear. In a letter to my father dated January 7, 1836, the following remarks are made by my aunt in reference to this change :—

"He has I think felt Robt. P——'s loss a good deal. Not that I mean to say he cared much for him as a favourite friend—but merely as a companion, Herbert still continuing so dependent on others for amusement and happiness. I know this is natural to all young people; but I do not think for that reason they are improved by having companions constantly with them—I mean boys of their own age. He still continues very reserved; but I certainly see a great improvement in many things."

Correspondence soon after this refers to some facts which perhaps have a general physiological meaning, and are therefore here worth noting, though otherwise of no interest. I was, it seems, growing rapidly—three inches per year: having previously been rather slow of growth. In a letter to my father which quotes remarks made about my increasing stature, there is a statement respecting my mental condition, which neither I nor those around seem to have suspected had any relation to the rapid growth, though it probably had. Here is a quotation :—

"I do not find my mind in as bright a state as I could wish. Just now I feel as though I had lost nearly all my energy. I think it is partly owing to want of competition, for now P—— is gone I have less stimulus to exertion; but I do not think it can be all owing to that and I am at a loss to account for it."

My uncle, too, at the same period comments on my dulness and failure of memory. Certainly this last trait must have been very marked. Not only have I absolutely forgotten some books I read at that time, but until perusal of my letters proved that I had read them, I did not know that I had ever seen them. Was not growth the cause? If excess of muscular effort, as in a pedestrian tour, is apt to leave behind inertness of brain, which for a time makes mental work difficult, it is reasonable to suppose that an unusual draft upon the resources of the system for building up the body, may, in like manner, leave the brain inadequately supplied, and cause feebleness in its action.

It is worth inquiring whether in such cases there is not produced a simultaneous moral effect. If there is such an effect, an explanation is yielded of the fact which the correspondence of the time proves, that there occurred a deterioration in my relations to my uncle and aunt. I got out of favour with them, and I was dissatisfied with my uncle's treatment of me. Is there not reason to think that rapid growth may temporarily affect the emotional nature disadvantageously, in common with the intellectual nature? As in children failure of cerebral nutrition, when caused by inactivity of the alimentary canal, is commonly accompanied by ill-temper; so, it seems not improbable that when the failure of cerebral nutrition is caused by the demands made for increase of the bodily structure, a kindred result may be entailed. Conditions which bring about a defective supply of blood to the brain, tend to throw the higher powers out of action while they leave the lower in action: the later and less evolved faculties feeling the effects of an ebb-tide of blood, more than the earlier and fully evolved ones. Such a relation, if proved to exist, should be taken into account in the treatment of young people.

Nothing worthy of record occurred during the spring of 1836. The treacherousness of memory complained of,

while it decreased my already-small aptitude for linguistic studies, told less in other directions. That which remained with me best was the mathematical knowledge I had acquired; for though the details of this slipped, I readily renewed them. Thus in May 1836 I describe myself in a letter as going through six books of Euclid in a week and a half.

This appears to have been my last piece of student-work. In June I went home finally; and my life at Hinton closed after having lasted three years—or rather, deducting the intervals spent at home, nearly two years and a half.

A brief review of its results may be worth making. Certainly it had been physically advantageous. I returned to Derby strong, in good health, and of good stature: my ultimate height (not then reached, however), being five feet ten inches. I had doubtless benefited both by the rural life and by the climate, which is bracing.

Intellectually I had profited much. A fair amount of mathematics had been acquired; and the accompanying discipline had strengthened my reasoning powers. In the acquisition of languages but trifling success had been achieved: in French nothing beyond the early part of the grammar and a few pages of a phrase book; in Greek a little grammar I suppose, and such knowledge as resulted from rendering into English a few chapters of the New Testament; and in Latin some small ability to translate the easy books given to beginners—always, however, with more or less of blundering. Education at Hinton was not wide in its range. No history was read; there was no culture in general literature; nor had the concrete sciences any place in our course. Poetry and fiction were left out entirely. All shortcomings recognized, however, I derived great benefit from being made to apply far more than I should have done otherwise. Probably, but for my life at Hinton I should have gone on idly, learning next to nothing.

Morally, too, the *régime* I had lived under was salutary.

Unfortunately during the years of my life at home, there was not that strong government required to keep me in order, while there was a continual attempt at government: the results being frequent disobediences and reprimands. Out of the objectionable mood of mind consequent on this, my uncle's firmer rule got me. It was better to be under a control which I no doubt resented, but to which I had to conform, than to be under a control which prompted resistance because resistance was frequently successful. The best results would have been achieved by one who had my father's higher ideal along with my uncle's stronger will. Had there been an adequate appeal to the higher nature, something much superior would, I think, have resulted; for I remember cases which prove that I might have been self-coerced through the sympathies and affections had these been kept awake. One of the defects in my uncle's training was due to the asceticism in which he had been brought up. This prevented him from adequately recognizing the need for positive amusement. There was in the daily life laid out for us little provision for other relaxation than that which came from leaving off intellectual work and turning to some occupation out of doors, such as gardening.

But criticism is somewhat out of place. I was treated with much more consideration and generosity than might have been expected. There was shown great patience in prosecuting what seemed by no means a hopeful undertaking. Had I been in my uncle's place I think I should soon have relinquished it. Of my aunt, also, I may say that there was displayed by her much kindly feeling and a strong sense of duty. Indeed they might be instanced in proof that religious convictions reinforce naturally right tendencies, and cause perseverance in good works notwithstanding discouragements. Reading the correspondence has impressed me strongly with the fact that I owe very

much to them. They had to deal with intractable material—an individuality too stiff to be easily moulded.

On reading over the foregoing account, based partly on my own recollections and partly on family correspondence, it occurs to me that the impressions it leaves may need discounting: more especially the impressions likely to be produced by the letters of my father and my uncle. Some of the unquoted passages written by them, show that in forming their estimates of me they used, as measures, the remembrances of their own boyhood, and also show that they were eminently "good" boys. Thus gauged, not by the average boy-nature but by an exceptional boy-nature, I was more unfavourably judged than I should otherwise have been. I am led to make this remark by recalling the descriptions of doings at boys' schools (and especially public schools) which I have occasionally read; ending with the recent incident at King's College School, (April, 1885) where a boy's death resulted from ill-usage by his school-fellows. Certainly the brutalities commonly committed I could never have committed. Transgressions due to insubordination, such as going out of bounds and the like, would probably have been more numerous than usual; but transgressions of a graver kind would, I believe, have been less numerous. The *extrinsically*-wrong actions would have been many, but the *intrinsically*-wrong actions would have been few.

I do not insist much on this qualification, but it occurs to me to name it as perhaps one that should be made.

CHAPTER VIII.

A FALSE START.

1836—37. Æt. 16—17.

LETTERS dating fifty odd years back, enabled me to give to the last chapter a much more graphic character than memory alone would have enabled me to give it. In describing the year and a half which now follows, correspondence gives me but little aid. As I was at home throughout this interval, the occasions for reference to me in the communications between Hinton and Derby were comparatively few. Such incidents only as I can recollect must fill in the space.

Not long after my return my father, possibly because he wanted the information, but more probably because he wished to test my ability to apply the knowledge I had gained, sent me over to Kirk Ireton to make a survey of the small property there belonging to him—two fields and three cottages with their gardens: a property which had been in the family for several generations. About the methods used in surveying I knew nothing. The subject had not been touched at Hinton. But my father was right in what I presume was his expectation, that my geometrical knowledge would adequately serve me in executing so simple a task. I brought him back the survey next day.

What gave me an interest in architecture at that time I cannot remember; but something prompted me to make designs for a country house. They were very absurd in relation to their end; for the arrangements were, I

remember, simply those of a town house transferred into the country. But the drawings, still existing somewhere among my papers, show a certain amount of aptitude as a draughtsman—if the word is applicable to a youth of sixteen.

It was either during the autumn of 1836, or during that of 1837, that I hit upon a remarkable property of the circle, not, so far as I have been able to learn, previously discovered: one which falls within the division of mathematics originally called Descriptive Geometry, but now known as the Geometry of Position. I did not then attempt a proof. This was not supplied until some two years later. The theorem and its demonstration were eventually published. (See Appendix B.)

One further recollection I may set down as at once amusing and characteristic. The possibility of a day's fishing in the Trent had suddenly presented itself. Eagerly occupying myself during the previous evening in getting ready my appliances, I retired to bed somewhat early with the intention of starting at daybreak. Even in those days much excitement kept me awake; and the forthcoming gratification so filled my thoughts that for hours I vainly turned from side to side. All the while the room was partially illuminated by the light of a full moon, which penetrated the white curtains. Somewhere about three o'clock the thought occurred to me—Why lie here tossing about? Why not start at once? The thought was forthwith acted upon. I got up, dressed, sallied out, walked by moonlight to Swarkstone, five miles off, and began fishing by moonlight.

My father had formed a high estimate of the dignity of his profession. He held, and rightly held, that there are few functions higher than that of the educator.

As ordinarily conceived and as ordinarly discharged, the function does not draw to itself much respect. Partly, under-

valuation of the teacher is a concomitant of that undervaluation of knowledge, which has characterized past times; and dates back to feudal days, when reading and writing were not among knightly accomplishments, and when learning was considered as properly left to the children of mean people. Partly, however, it is consequent upon the low quality of the teacher, as he has been exemplified in ordinary experience. Not uncommonly the occupation of training the young has, among men, been undertaken by those who have failed in other occupations; and, among women, by those who have been left destitute or in difficulties—people with no pretension either to natural fitness or to special preparation. The usual belief has been that anyone might hear lessons said, or teach writing, or point out errors in sums. Even the abilities displayed by those who have filled the higher posts—masters in public schools and the like—have not been such as to inspire their pupils or others with much reverence. Men who have gone on generation after generation pursuing a mere mechanical routine — men who have never brought any analytical faculty to bear on the minds of their pupils—men who have never thought of trying to ascertain the normal course of intellectual development, with the view of adapting their methods to the successive stages reached—men who have, from the earliest days down to the present time, taught abstractions before their pupils have acquired any of the concrete facts from which they are abstractions; such men, I say, have naturally failed to impress their fellow-citizens. One who, not being a slave of tradition, contemplates schools as they have been, and as many of them still are, instead of being struck by the stupidity of the pupils, may more reasonably be struck by the stupidity of the masters.

It was because his ideal of education was so much higher than that commonly entertained, that my father differed from most persons so widely in the rank he

assigned to the teacher's office. If he did not make mental development a subject of deliberate study, yet he had reached some general ideas concerning it, and saw the need for adjusting the course of instruction to the successive stages through which the mind passes. Instead of persisting in methods devised in rude times and unthinkingly persevered in down to our own, he constantly sought for better methods. Always he aimed to insure an intelligent understanding of that which was taught: never being content with mere passive acceptance of it. And perceiving how involved a process is the unfolding of intellect, how important it is that the process should be aided and not thwarted, and what need there is for invention and judgment in the choice of means, he saw that, carried on as it should be, the educator's function is one which calls for intellectual powers of the highest order, and perpetually taxes these to the full. Not in intellect only, but in feeling, did his conception of the true educator demand superiority. He habitually sought, and sought successfully, to obtain the confidence of his pupils by showing sympathy with them in their difficulties and in their successes; and thus secured a state of mind favourable to intellectual achievement, as well as to emotional improvement. He might, in short, be placed in contrast with that schoolmaster of Carlyle, described in his *Reminiscences;* and of whose harsh treatment of the stupid, Carlyle speaks admiringly after his manner.

Thus estimating so highly his profession as one inferior to few in order of natural rank, my father evidently desired that I should adopt it. He never, however, definitely expressed his desire: perceiving, I fancy, that there was on my part a reluctance.

Had it not been at variance with his nature to lay a plot, I might have supposed that my father had plotted to lead me into the career of the teacher. One day towards the

end of July 1837, he told me that Mr. Mather, the schoolmaster with whom I had been during the earlier part of my boyhood, had lost his assistant, and had failed to find another. His vacation was coming to a close: leaving him, as he said, in some difficulty. The question put to me was, whether I would play the part of assistant until he obtained one. I had been at home for a year doing nothing; and though to assent went against my inclination, I felt I could not do otherwise than assent.

Whether advised to do so by my father, or whether of his own motion, I do not know, but Mr. Mather assigned to me the least mechanical part of the teaching; and in this I succeeded fairly well—perhaps, indeed, better than most would have done. A certain facility of exposition being natural to me, I had also, by implication, some interest in explaining things to those who did not understand them. Hence in respect of the subjects I dealt with, my lessons were at once effective and pleasure-giving. Especially with geometry I succeeded so well that the weekly lesson was eagerly looked forward to; and in our miscellaneous readings, I managed by comments and pieces of information beyond those contained in the books read, to create willing attention and resulting good recollection. In short, led mainly I doubt not by the example of my father, and partly by personal experience, I fell into natural methods rather than mechanical methods.

Very possibly, bearing in mind the account I have given of myself in the last chapter, the reader will infer that my relations with those under my control were inharmonious. If he does so, he will be wrong, however. It has been often remarked that the slave and the tyrant are in nature the same; and that it is merely a question of circumstances which part is played. The converse proposition, if not true in full measure, is partly true. He who by nature is prone to resist coercion, is, if duly endowed with sympathy, averse to exercising coercion. I say if duly endowed with

sympathy; because, if devoid of it, he may be prone to assert his own claims to freedom of action, while regardless of the claims of others. But supposing he has adequate fellow feeling, his mental representations will, in a measure, deter him from habitually using that power over others which he dislikes to have used over himself. Such at least is a connexion of traits which I have elsewhere sought to show holds in men's social relations, and which held in my relations with my pupils. My experience extended over three months; and during many Saturday-afternoon rambles in the country, when I was in sole charge, there was, I believe, no instance in which any difficulty occurred —no exercise of authority on the one side and resistance on the other. Partly in consequence of the friendly feelings that had been produced by my way of conducting studies, and partly because I did not vex by needless interdicts, complete harmony continued throughout the entire period.

Should I have succeeded had teaching become my profession? The answer is ambiguous—Yes and No. In some respects I should, probably, have proved well adapted to the function; but in other respects not at all adapted.

In a preceding chapter I have remarked that the habit of castle-building which was so strong in me as a boy, and, continuing throughout youth, did not wholly cease in adult life, passed gradually into the contemplation of schemes more or less practicable. One of these, often dwelt upon not very many years ago, was that of founding an educational institute, including lower and higher schools, in which I should be able to carry out my own plans, alike for intellectual culture, moral discipline, and physical training. The detailed arrangements to be made in these respective departments, often occupied my thoughts during leisure hours; and I think it not improbable that, had I been put in possession of the needful means, and

furnished with a sufficient staff of adequately intelligent assistants, I might have done something towards exemplifying a better system of education. Freed from the executive part of the work, and responsible only for devising methods, superintending the execution of them, and maintaining order, the function would have been one not unsuitable to my nature; and might have been well discharged. At the time, however, when these day-dreams occasionally occupied me, I was already committed to an undertaking more than sufficient for my energies.

But while under such ideal conditions I might have achieved a success, under ordinary conditions I should, I believe, have failed. In the first place, I dislike mechanical routine; and though rational plans of education would make lessons much less mechanical than they are at present, a considerable part must always remain mechanical. In the second place, I have a great intolerance of monotony; and many, if not most, of a teacher's duties are necessarily monotonous. In the third place, my desire to carry out my own ideas, alike in respect to what constitutes a good education, in respect to the methods used, and in respect to the order followed, would probably have caused frequent differences with parents. As I should have been very reluctant to surrender my plans, while most parents would probably have insisted upon the adoption of something like the ordinary *curriculum*, serious breaches would have frequently occurred.

So that, for these several reasons, it seems to me likely that, had I been led into the career of a teacher, I should after a time have thrown it up in disgust.

The experiment was not to be tried, however. There now occurred an incident which determined my course of life for a period of years.

My uncle William had gone to London early in November, 1837, and before the end of the first week, I received a

letter from him telling me to come up immediately. The reason assigned was that he had obtained for me a post under Mr. Charles Fox, mentioned in a foregoing chapter as being, in 1834, under Mr. Robert Stephenson on the London and Birmingham Railway during its construction, and who had now become permanent resident engineer of the London division. He had, I believe, during our visit to him at Watford three years previously, formed a favourable estimate of me, in so far as my fitness for engineering was concerned; but friendship for my father was, I suspect, the chief motive for offering me the appointment.

Of course the offer was at once accepted. Already, as I see by letters, the profession of a civil engineer had been one named as appropriate for me; and this opening at once led to the adoption of it.

PART III

CHAPTER IX.

COMMENCE ENGINEERING.

1837—38. ÆT. 17—18.

EVEN in the absence of letters I should have known that I arrived in London on the 8th November, 1837; for the next day furnished an incident which fixes the date. The Queen, who had but lately succeeded to the throne and was not yet crowned, dined with the Lord Mayor in the City on the 9th November; and the occasion called for a State-pageant. To see this I was, the morning after my arrival, taken by my uncle and the friends he was visiting in London. It was the only royal procession, or display of allied kind, which I ever saw.

The office of Mr. Charles Fox, in which I was for an interval to pass most of my days, was at the Chalk Farm Station. It is no longer extant; having been demolished to make room for the North London Railway, which crosses the Hampstead Road and enters the station just over its site. Here I presented myself on the 10th, and made acquaintance of some who were to be my companions. On the day after came my first experience of railway travelling, gained during an excursion with Mr. Fox as far as Tring—the point to which the London and Birmingham Railway, as it was then called, was open. Locomotion was less rapid than it is now. In the course of our journey, Mr. Fox took out his watch, and, noting the passing of the mile-posts, calculated that we were going at 30 miles an hour, which he thought a high

speed. Nor was the rolling-stock at that time much like what it is at the present time. The engines used on the London and Birmingham line had but four wheels, and weighed only ten tons. The first-class carriages were, as nearly as might be, made to represent three coach-bodies joined together; and, in pursuance of the tacit desire to repeat coaching usages, every first-class carriage had a guard's seat on the outside at each end: an arrangement which did not cease until a guard was killed by collision with the arch of a bridge, while inadvertently standing on the roof of a carriage. The second-class carriages, evidently intended to simulate the outsides of coaches as much as was practicable, had no sides, and were covered by roofs supported on vertical iron rods, so that the wind and rain could blow through from side to side.

Bradshaw's Guide, too, was not yet—did not commence till the autumn of 1838, when it made its appearance in the shape of some three or four leaves. There have been disputes as to the date of its origin, but I speak from definite remembrance.

Already it has been stated that Mr. Charles Fox, who, fourteen years after, became well known as the designer and constructor of the Exhibition-Building of 1851, and was afterwards knighted, had been a pupil of my father; and there has also been named the fact, that in 1834, I had, in company with my father and mother, paid a visit to him at Watford, where he filled the post of sub-engineer. From this post he had some time after been transferred by Mr. Robert Stephenson, the engineer-in-chief, to superintend under him the construction of what was in those days known as "The Extension." For the London and Birmingham Railway was originally intended to stop at Chalk Farm; and only in pursuance of an afterthought was it lengthened to Euston Square. Mr. Charles Fox's

faculty had, probably, soon made itself manifest to Mr. Stephenson. He had no special discipline fitting him for engineering — very little mathematical training or allied preparation; but in place of it he had a mechanical genius. Much of the work on "The Extension" for which Stephenson got credit, was originated by him: among other things, the iron roof at Euston Station, which was the first of the kind ever made. After the Extension was finished he was appointed resident engineer of the London division of the line: his limit being Wolverton. Parts of this division were still incomplete; and beyond the completion of these there devolved on him much business with contractors—measuring up work and making small surveys. He had, possibly, represented to the directors that his time was unduly absorbed in these details; for it was to undertake them that I was appointed. He had seen something of me during our visit at Watford in 1834, and possibly the fact that I had surprised a pupil of his, Mr. Frank Conder, by solving a problem in trigonometry he set me by way of test, gave him some confidence in my ability to discharge these not very difficult duties. The salary was only £80 a year, with a prospect of increase to £150; but for a youth of 17 this was not amiss: especially considering that the post gave valuable opportunities of obtaining information and undergoing discipline.

My chief companion at first was Mr. George Harris, a pupil of Mr. Fox. Our occupations were scarcely distinguishable. Many not unpleasant days were passed together during the winter and early spring in surveying at various parts of the line. It was, indeed, disagreeable in muddy weather to make measurements of "spoil-banks," as are technically called the vast heaps of earth which have, here and there, been in excess of the needs for making embankments, and have been run out

into adjacent fields; and it was especially annoying when, in pelting rain, the blackened water from one's hat dripped on to the note-book. The office-work, too, as may be inferred from the tastes implied by the account of my education, came not amiss. There was scope for accuracy and neatness, to which I was naturally inclined; and there was opportunity for inventiveness. So fully, indeed, did the kind of work interest me, that I shortly began to occupy the evenings in making a line-drawing of a pumping engine for my own satisfaction, and as a sample of skill as a draughtsman.

Letters show that I was quite alive to the responsibilities of my post, and resolute to succeed. During the whole of this sojourn in London, lasting over six months, I never went to a place of amusement; nor ever read a novel or other work of light literature. Evenings not spent in drawing or in calls on friends, were devoted to rambles about London; and these, of course, were interesting to a youth of my age and inexperience. One incident attendant on these rambles remains with me. To my great astonishment I found myself in a large square lighted with oil lamps: the time being one when the use of gas was almost universal, and when, indeed, in provincial towns like Derby, oil lamps had practically disappeared. This square was Grosvenor Square. It struck me as curiously significant that in this centre of fashionable life there should still survive the old system of illumination when it had elsewhere been replaced by a better.

Letters to my father now written, recall letters written from Hinton during my boyhood, in the respect that considerable spaces in them are occupied by mathematical questions and other spaces by suggested inventions improvements. One dated about Christmas contains demonstration of a theorem in conic sections, and some speculations—very crude ones indeed—

the relation between pressure and expansion of steam, and the relation of the two to temperature. In a letter of February 7, I find the passage:—

"You will very likely recollect that while I was in Derby I made many experiments on the formation of curves, and some of them, of which you first suggested the idea, were formed by the motion of a line of a given length through a fixed point: one end being moved according to some particular conditions and the other end describing some peculiar curve."

There follows an example of such a curve, with the sketch of a suggested instrument for utilizing the idea. A page of a letter of March 10 is occupied by solutions of problems my father had sent, and another page by a calculation he requested me to make of the allowance for curvature of the Earth in levelling. Then, later on in the spring, come accounts of improved methods of keeping the note-book of a survey and of ranging straight lines.

This tendency to independent thinking had, as at Hinton, disagreeable concomitants. On one occasion Mr. Fox passed some criticisms upon my tendency to differ from companions, and from officials with whom I had dealings. Unhappily the particular case which led to the expostulation was one in which, because of my better mathematical culture, my disagreement with an official was well warranted. The effect would have been greater had I been proved wrong.

Towards the end of May came a change in my occupation and place of abode; as is shown by the following passage from a letter home dated Wembly, near Harrow, June 12:—

"You will see by the date of this letter that I am not at present staying in London. I have now been down in the country rather more than three weeks, where I am staying as the Company's Agent to superintend the completion of the approach roads to the Harrow Road bridge. My duties consist in seeing that the contractor fulfils the terms of the contract, and also to take care that when he draws money on account he does not get more than an equivalent for the work done.

. . . I have now a good deal of time for study, &c., and I am making pretty good use of it. The inclosed [6] solutions of problems on the second book of Chambers [Euclid] I made out in one morning whilst seated under one of the arches of the bridge, where I had taken shelter from the rain. . . . I went to London a few days after I came and got a drawing-board, paper, &c., and commenced the drawing of a locomotive engine for myself. The drawing which I am copying is merely in lines, but the drawing which I am doing I have commenced colouring and shall finish in about a fortnight."

In July my father spent a week with me at Wembly, pleasantly relieving for a time the monotony of the life. As is implied by several passages in letters, this was a good deal felt. The following is dated August 3.

"I am sorry to say that from all I can see I shall continue here some time longer. Since you went we have commenced curing the slips which you saw when you were here. I have had them almost entirely under my own management. . . . We had an accident close by here a few days ago. An engine with a train of sheep ran off the line. . . . I was on the spot very soon after the accident and remained until the engine was got on again about 11 o'clock at night. . . . I was very much struck with the promptness and tact which Mr. Fox displayed in the management of the concern. The appearance of things was more altered for the better in 10 minutes after he had turned to, than it had been for an hour before."

Then followed sketches of an appliance by which I proposed to make some kinds of sewing "much easier, more expeditious, and perhaps neater." Before the close comes the sentence:—

"In your next letter send me word what are your ideas about the revolution of the magnetic pole. Do you think it has any connexion with the precession of the equinoxes?"

Evidently the characteristic excursiveness of thought was continuing and perhaps increasing.

An amusing adventure experienced during my stay at Wembly is worth narrating. Mr. Fox wished to have a survey of the Wolverton Station, in preparation, probably for enlargement. Harris and I were sent down one day early in August to make this survey; and we completed it before evening set in. Wolverton, being then the tem

porary terminus, between which and Rugby the traffic was carried on by coaches, was the place whence the trains to London started. The last of them was the mail, leaving somewhere about 8. If I remember rightly there were at that time only five trains in the day, and there were none at night. A difficulty arose. This mail-train did not stop between Watford and London, but I wished to stop at the intermediate station—Harrow: that being the nearest point to Wembly. It turned out that there was at the Wolverton Station no vehicle having a brake to it—nothing available but a coach-truck. Being without alternative, I directed the station-master to attach this to the train. After travelling with my companion in the usual way until we reached Watford, I bade him good-night and got into the coach-truck. Away the train went into the gloom of the evening, and for some six or seven miles I travelled unconcernedly: knowing the objects along the line well, and continually identifying my whereabouts. Presently we reached a bridge about a mile and a half to the north of Harrow Station—the Dove-house Bridge, I think it was then called. Being quite aware that the line at this point, and throughout a long distance in advance, falls towards London at the rate of 1 in 330; I expected that the coach-truck, having no brake, would take a long time to stop. A mile and a half would, it seemed, be sufficient allowance; and on coming to the said bridge I uncoupled the truck and sat down. In a few seconds I got up again to see whether all the couplings were unhooked; for, to my surprise, the coach-truck seemed to be going on with the train. There was no coupling left unhooked, however, and it became clear that I had allowed an insufficient distance for the gradual arrest. Though the incline is quite invisible to the eye, being less than an inch in nine yards, yet its effect was very decided; and the axles being, no doubt, well greased, the truck maintained its velocity. Far

from having stopped when Harrow was reached, I was less than a dozen yards behind the train! My dismay as we rushed through the station at some 30 miles an hour may be well imagined. There was the prospect of having to push back the truck after it had stopped; and, judging from the small loss of velocity during the preceding mile and a half, the stoppage seemed likely to be remote enough. There now, however, commenced a cause of retardation which I had not counted upon. From the Dove-house Bridge to the Harrow Station, the line is straight; but immediately after passing the Harrow Station it enters upon a curve. Of course the result in this case was that there came into play the friction of the flange of the outer wheel upon the outer rail. A loss of velocity necessarily followed. The train now began rapidly to increase its distance, and shortly disappeared in the gloom. Still, though my speed had diminished, I rushed on at a great pace. Presently, seeing at a little distance in front the light of a lantern held, I concluded, by a foreman of the plate-layers, who was going back to the station after having seen the last train pass, I shouted to him; thinking that if he would run at the top of his speed he might perhaps catch hold of the waggon and gradually arrest it. He, however, stood staring; too much astonished, even if he understood me; and, as I learned next day, when he reached Harrow Station reported that he had met a man in a newly-invented carriage which had run away with him! Failing this method of bringing my undesired journey to an end there arose the thought of trying to stop the truck myself. I unfastened one of the cross-bars (used to steady a carriage placed on the truck), and tried to press the end of it against the tyre of the wheel. I soon found, however, that this necessitated leaning over so much that I should be in danger of tumbling out, and gave up the attempt.

After being carried some two miles beyond the Ha[illegible]

Station, I began rather to rejoice that the truck was going so far; for I remembered that at no great distance in advance was the Brent siding—a place, just to the north of the Brent embankment, where a line of rails diverged from the main line into a side-cutting, and into which the truck might easily be pushed instead of pushing it back to Harrow. I looked with satisfaction to this prospect; entertaining no doubt that the waggon would come to rest in time. By and by, however, it became clear that the truck would not only reach this siding but pass it; and then came not a little alarm, for a mile or so further on was the level crossing at Willesden: Willesden being at that time a village having no station, and the level crossing (where there is now a bridge) serving merely to give continuity to a quiet lane. I knew that after the last train had passed, the level-crossing-gate would be closed against the line; and that if the truck went on as it was going it would run full tilt against the gate, and I should probably be thrown out and killed. However, there was one saving fact—the incline of 1 in 330, down which the truck was rushing, came to an end some distance before Willesden. I was soon made aware of this fact on reaching the Brent bridge; for the truck then began to slacken speed, and finally came to a stand in the middle of the embankment crossing the Brent valley.

Here was I then, between 9 and 10 at night, with this truck far away from any station, and having to provide for the safety of the line next morning. I forthwith walked to the level crossing at Willesden and aroused the man in charge. He came to the window of his bedroom and listened sceptically for some time to my statement: thinking it was an attempt to hoax him. However, on telling him that if a train was thrown off in the morning he would be responsible for the result, he believed, dressed himself and came out, walked with me along the line to the place

where the truck was standing, and joined me in pushing it back to the siding. But the adventure was not ended. It happened that the switch leading into this siding was a peculiar one; and, not being aware of the peculiarity, we ran the truck off the rails. Here seemed a still greater dilemma. However, by our united efforts, helping ourselves with sleepers lying at hand and using a cross-bar of the truck as a lever, we finally heaved the truck on to the rails again, and, pushing it into the siding, blocked it safely. I then made the best of my way to the farm-house at Wembly in which I was staying: arriving there between 12 and 1 o'clock in the morning. Of course the incident was not kept a secret by those who were witnesses; and, as may be imagined, caused a good deal of laughter at my expense.

Something much more important to me, though less amusing to the reader, soon after happened. A letter to my father dated Wembly, August 23, runs thus:—

"I have got capital news for you and I have no doubt that you will rejoice with me in my improved prospects. Mr. Fox has just made me an offer to go on to the Gloucester and Birmingham Railway at a salary of £120 yearly, and says he has little doubt but I should soon be raised to £200 per annum. The situation at first would be one of a draughtsman, and if found competent I should be raised to a sub-assistant engineership. As an additional encouragement, and a very flattering compliment to me, Mr. Fox pointed out the instance of Conder [a pupil of his while he was at Watford] who has been some time holding a situation of £200 a year [on the Birmingham and Gloucester] 'although,' Mr. Fox said, 'he has not got his wits about him nearly as much as you have.' I also hear very pleasing account of Captain Moorsom, the head Engineer of the railway, whom I shall be under. Mr. Fox says he is one of the nicest men that he knows; a real gentleman, and a benevolent, good-hearted man. Before I heard all the particulars I was very much inclined to refuse it, because I should so much have preferred to remain with Mr. Fox; but as I said, the number of officers employed on the railway will be gradually diminishing, and my present situation would most likely not last. . . . I am still busy at the Harrow-Road bridge and have almost the entire management of the slips. Mr. Eastt[illegible]

tractor] has been from home nearly all the time, and when he has been here he has not interfered with me. All the slips are now very nearly cured. I have had about 80 men under me for the last month."

It was agreed on all hands that the offer was one to be accepted, and arrangements were presently made for my departure.

To complete the narrative I ought to name my last piece of work before leaving London. A letter to my father thus describes it:—

"Mr. Fox has lately been appointed consulting engineer to the Greenwich Railway; and Harris happening to be very unwell at the time, I had to make surveys of the three stations before I came away. I had but four days to do the last two in and make the plans as well, so you may imagine that I had not much spare time."

None of the railways from the South and East were then existing. That which has now become a channel into which pour various large streams of traffic, was then nothing but an isolated few miles of line, evidently in a very unprosperous condition, with scanty and mean rolling stock, and termini not much larger than the existing stations at Deptford and Spa Road. Enlargements or improvements were to be made under Mr. Fox's supervision.

After finishing the plans of these stations and handing them to Mr. Fox, I bade good-bye to him and to my companions in the office at Camden Town, and left London for Worcester on the 24th September, 1838.

CHAPTER X.

LIFE AT WORCESTER.

1838—40. ÆT 18—20.

MANY of those born within the past generation are unaware of the fact that our great railways began as comparatively small ones, and have grown to their present sizes by successive extensions and still more by successive amalgamations. The railway on to the engineering staff of which I passed towards the end of September, 1838, at that time known as the Birmingham and Gloucester Railway, was one of these relatively small lines, subsequently lost by fusion with a vast system of lines. The Midland Railway, which at first ran only from Rugby to Leicester and thence to Nottingham and Derby, began, in the Forties, to incorporate other lines; first of all the North Midland, then the Birmingham and Derby, and soon afterwards this same Birmingham and Gloucester, which now forms a very small component. During its construction no one connected with it supposed that it would thus lose its individuality.

Our engineering offices were at Worcester, in a house which no longer exists. It was pulled down years ago to make room for a line of railway to Malvern, which crosses Foregate Street over the site it occupied. The second stage of my engineering career, there commenced, brou social surroundings of a previously unknown kind. like the pupils of Mr. Charles Fox, quiet youths, fully brought up (two of them being sons of di

ministers), the junior members of the Birmingham and Gloucester staff belonged largely to the ruling classes, and had corresponding notions and habits. Our chief engineer, Capt. Moorsom, having been a military man, and having as his two resident engineers (for the Birmingham division and the Gloucester division) military men also—Royal Engineers—showed his leanings, or perhaps chiefly his friendships, by gathering together, as sub-engineers and draughtsmen, young fellows whose connexions were in most cases military or naval. There were, however, some of other classes—one the son of a clergyman and himself a Cambridge graduate, Mr. G. D. Bishopp, who eventually was for a time the locomotive engineer of the line, and afterwards improver of the disc-engine; another, Mr. C. E. Bernard, brought up as an architect, who eventually settled at Cardiff; a third, Mr. H. Hensman, who, in later years, became engineer to the Bank of England; and others whose subsequent careers I need not specify, or know nothing about.

The superintendence was not rigid, and the making of designs was interspersed, now with stories not of an improving kind, now with glances down on the passers-by, especially the females, and resulting remarks: there being also a continuous accompaniment of whistling and singing, chiefly of sentimental ballads. As may be supposed, the code of morals (using the word in that absurdly restricted sense now commonly given to it) was not very high. It is an unfortunate concomitant of the engineering profession that it habitually carries young men away from those surroundings of family and friends and neighbours which normally serve as curbs, and places them among strangers whose opinions and criticisms exercise over them little or no influence. It is with them as with medical students, who, similarly free from the restraints of home, and not put under such restraints as young men at Oxford and Cambridge are subject to, show the

effects in randomness of living—to use the mildest expression.

Not unfrequently the behaviour of our companions was matter of remark between myself and a steady member of the staff, with whom I became intimate; and we used to agree that it was impossible they should come to any good. We were wrong, however. Sundry of them, whose after-careers I have known, have turned out very respectable men—one especially, who, during many years, has been exemplary in all relations, domestic and social; and who, though in those early days without any thought beyond selfish pleasures, has, during a long mature life, been a man of high aspirations as well as model conduct. Let me add that, strangely enough, this change in him has been the concomitant of a change from the so-called orthodox views in which he was brought up, to the so-called heterodox views which he has held during these forty odd years.

"And who are the two in the brown coats?" This question was put to one of our staff at a Worcester ball, by the daughter of a physician living opposite to our office, who daily saw the goings and comings of those engaged in it, and doubtless made criticisms upon them as they did upon her and her sister.

The question referred to my friend G. B. W. Jackson (already indirectly referred to above) and myself, wh both happened to wear frock coats of brown cloth- colour at that time not uncommonly worn. A quest from my father concerning him brought out the follow description:—

"Jackson is about 24 years old. He was educated chiefly in Gerr and was articled to Mr. Wishaw, civil engineer. He had been some y in business for himself before he came here. He is a Moravian and steady; not very quick of comprehension. He has great perseve He knows no more of classics than I do; is very fond of landsca ing which he has practiced a good deal whilst travelling on the

and I should say rather economical. There is a queer jumble of particulars!"

When, in the course of 1839, my father visited me, he formed a very high opinion of him, as witness a passage in a subsequent letter to me:—

"I have thought it not unlikely that your noble-minded friend Jackson may have had something to do with suggesting it [an improvement in my official position]. I believe it to be his principle to do a good turn wherever he can. I hope you will cultivate his friendship. I wish you saw his nature as I do. Accustom yourself to open your heart to him as an elder brother."

He was the son of Dr. Jackson, at that time foreign secretary to the Bible Society. Of somewhat ungainly build, and with an intellect mechanically receptive but without much thinking power, my friend was extremely conscientious—one whose sense of rectitude was such that he might be trusted without limit to do the right thing. Without limit, did I say? Well, perhaps I should make a qualification, and say that in all simple matters he might be implicitly trusted. For I remember once observing in him how needful an analytical intelligence is in cases where a question of right and wrong is raised out of the daily routine. The moral sentiments, however strong they may be, and however rightly they may guide in the ordinary relations of life, need enlightenment where the problems are complex.

In one respect his companionship was, perhaps, not so desirable. Association with a man whose intellectual powers were above my own would have been more advantageous. The effect of our intercourse was to encourage, rather than to repress, the critical and self-asserting tendency in me, already sufficiently pronounced.

Alien in culture, ideas, sentiments, and aims, from most of the young men with whom this new engagement brought me in contact, they regarded me as an [illegible]. Constitutionally wanting in reticence, I never [illegible]ed my dissent from their opinions and feelings

whenever I felt it. This tendency to pass adverse judgments was soon observed and commented upon. "He is a queer fellow; he's always finding fault with something or other," was the kind of remark made in my presence. The criticisms I so unwisely made were commonly not without good cause. Most of these junior members of the staff, engaged in making plans under direction, were without engineering faculty, and had no interest in their work beyond that of carrying out orders as best they might. Having but rudimentary knowledge of mathematics and none of mechanics, they were incapable of giving any scientific reasons for what they did; and hence there continually arose occasions for commenting on things that were wrong.

How little the thought of policy deterred me from displaying this constitutional habit, may be judged from two instances which occurred. Happening to glance at some plans which were being finished by one of these companions, I observed a shadow incorrectly projected. My remark upon it was met by the reply that it must be right, since he had been shown how to project the shadow by the resident engineer, Mr. Hughes. Prudence would have dictated silence; but yielding to a dictum, however authoritative, which I believed to be wrong, was not in my nature. To prove that I was right I made a model in cardboard of the structure represented, and, by using an artificial light, proved experimentally that th shadow would take the form I alleged. Of course thi conduct, coming to the ears of my superior officer, wa not to my advantage. Still more absurd, from a pr dential point of view, was another criticism of mine upo a proposed system of laying the rails—five feet bearing between the chairs, with intermediate "saddles," as t were called, yielding vertical support but no l support. Led by experience gained on the Lond Birmingham, I perceived that this arrangement, s

by Mr. Hughes and adopted by Captain Moorsom, would not answer—that the lateral oscillations of the engines would cause bulging in the intervals between the chairs. In due time this prophecy proved to be well founded; but the utterance of it by a young fellow of eighteen implied an offensive disrespect for those above him.

Of course the traits of character thus illustrated, did not conduce to friendship with those around. After a time, however, the unfavourable impressions at first produced wore off. It was discovered that within the prickly husk the kernel was not quite so harsh as was supposed. Eventually amicable relations were established, and our intercourse became harmonious.

As compared with most lives, the lives led by the junior members of the B. and G. staff were not trying or unpleasant. Our office hours were from 9 to 5, with an interval of an hour in the middle of the day; and we had, what was at that time quite an exceptional thing, the Saturday afternoon to ourselves.

This leisure half-day was, when the weather permitted, often utilized for excursions. Sometimes my friend Jackson and I walked out to the line, the nearest point of which, Spetchley, was some four miles from Worcester, to inspect the work going on. During the summer of 1839 we betook ourselves to boating on the Severn; now and then going as far up as a place which was named Holt Fleet. Other members of the staff were occasionally our companions, and, as we were young and in high spirits, these afternoons were especially enjoyable. At other times we took rambles in search of the picturesque; not on Saturdays only, but occasionally on Sundays: one Sunday, I remember, being devoted to an expedition up the valley of the Teme for some nine or ten miles. And I took a Sunday's solitary walk over to Malvern, [illegible] the "Worcestershire Beacon," kept along the

top of the range of hills to the far end, and, descending the "Herefordshire Beacon," returned to Worcester.

Save these Saturday-afternoon excursions and summer-evening walks into the country with Jackson, not many positive pleasures varied my life during this period; for, not associating with other members of the staff, I did not share those convivialities which they provided for themselves. How my leisure time was passed I do not distinctly remember. My impression is that though I bought Weale's book on bridges with the intention to master its contents, and though I took up other lines of engineering study, yet comparatively little serious work was done. Nor did reading of a non-professional kind occupy much space; save, indeed, novel-reading, of which there was a good deal.

Nevertheless it seems from my letters that there were commonly subjects of inquiry before me. Always I was more originative than receptive. Occupation with other people's thoughts was so much less interesting than occupation with my own. Correspondence shows that this was the case during these times at Worcester as during both earlier and later times. My taste for mathematics, or rather for geometry, is habitually shown, something like half of the space in letters being occupied either with questions propounded or with questions solved. By way of showing the ordinary mental activities during this period I cannot do better than string together a series of extracts. Under date November 10, 1838, after being at Worcester some six or seven weeks, I wrote:—

"You will be glad to hear that I have got into a more regular system of study since I have been in Worcester. I am beginning to feel the good effects of strict discipline, both as regards the capability of continued application and the pleasure which I find in the pursuit. I have had considerable success in the solution of problems, chiefly those contained in the exercises at the end of Chambers' *Euclid*. I made out the first 16 in the first book, all those in the second, the first 11 of those in the third."

And there follow some three pages of demonstrations. In a letter of December 2, occurs the passage :—"I thought I would try a question in Mechanics the other day and so set myself the following problem"—one concerning the pressure exercised by the top of a ladder against a wall when a man of a specified weight was standing at a specified point on it.

A letter of December 31 contains "a method of drawing the curve made by unrolling the oblique section of a cylinder," and also some designs for bridges of simple kinds. On January 19, 1839, some paragraphs were filled in describing a way of projecting shadows with illustrations; and then follows the passage :—

"I have become quite idle and stupid lately. I expect I am beginning to fill out a little and that all the energies are directed to bodily development. I do not recollect that you gave me your opinion whilst I was in Derby upon one of the questions I asked you. To what extent is it expedient to force the mind against the inclination? I should like to hear what my uncle Thomas says upon this head. It seems to me to be rather important to be able to distinguish between idleness and mental debility."

A very different subject occupies space in a letter of March 10 :—

"I have not come to any distinct conclusion why the Earth should fall to the Sun in less than a quarter of a year. The obstacle in the way of calculation is the increase of attraction as well as the accelerated velocity, and how to combine the two ratios is the question. From your manner of putting the case I should be led to suppose that there is some simple and conclusive reason for it. Many of the things which formerly used to appear very simple now appear complicated, on account of the many collateral circumstances which I used to overlook."

How habitual was this speculative *thinking* was well shown in the subsequent July. My father then paid me a visit of something like a fortnight, on his way to South Wales, where he was going to spend part of his midsummer vacation. The period was evidently utilized for [illegible]c discussions, as witness this extract from a letter [illegible]o my mother at the time :—

"I believe I must leave Worcester in my own defence for Herbert provides me with problems of so interesting a kind both to himself and to me that I find it difficult to relax entirely from mental pursuits and allow my mind to run wild."

Doubtless his presence acted as a stimulus, and there resulted even more speculation than usual.

A paragraph having some significance of another kind was written in August, 1839:—

"You will be glad to hear that I have had an addition of £15 to my salary, making on the whole £135. . . I have been given to understand that Mr. Hughes' letter of recommendation to the Directors was highly flattering, and he evidently expected that I should have had a greater addition than was granted. However, I am quite satisfied as it is."

A letter of October 9, 1839, yields a quotable passage:—

"I have just returned from a journey to Stourbridge, near Birmingham, where I have been staying for a few days on Company's business. I went to see after some points and crossings which you heard me mention as chiefly in my hands, and to give some directions and information concerning them."

Some sentences worth reproducing bear the date November 18, 1839:—

"I have been occupying my leisure lately in investigating transverse strength in all its forms. Several theories have suggested themselves, but I have not succeeded in coming to any very satisfactory issue.

"I have had some very interesting work lately. The designing is left in a much greater degree to myself than heretofore, and I can generally manage to persuade Mr. Hughes to agree to my plans."

The mental excursiveness exemplified during previous years is thus variously exemplified afresh.

This mental excursiveness occasionally had useful results. Some of the passages which are quoted below showing this, are of earlier dates than some of those given above; but they are here separated as being instances in which theory led to practice. Writing on March 10, 1839, I said:—

"You need not be afraid of my studying skew bridges on subject merely so as to be able to draw by rule.

nor even take any interest in, a subject which I do not understand; and when I do study anything it is generally with the intent to understand the principles. All I at present know of skew arches, and the method I have adopted in drawing them, are original. The only thing I remember to have borrowed from Mr. Fox, is his definition of a spiral plane."

There presently followed a new plan of projecting the spiral courses in bridges of this kind; and this plan I set forth in an article contributed to *The Civil Engineer and Architect's Journal* for May, 1839. It is reproduced in Appendix A, not because it has any interest for the general reader, but because it was my first published essay, save the two letters before mentioned which were written when a boy of fifteen.

During the latter part of 1839 the preparation of plans for crossings and sidings at various stations was put into my hands. A device for saving trouble was one of the consequences. Curves of very large radius had to be drawn; and, finding a beam-compass of adequate length difficult to manage, I bethought me of an instrumental application of the geometrical truth that angles in the same segment of a circle are equal to one another. An obvious implication is that if an angle be made rigid, and its arms be obliged to move through the two points terminating the segment, the apex of the angle must describe a circle. In pursuance of this idea I had made an instrument hinged like a foot-rule, but capable of having its hinge screwed tight in any position, and carrying a pen or pencil. Two needles thrust into the paper at the desired points, being pressed against by the arms of the instrument, as it was moved from side to side, its pen or pencil described the arc of a circle. When about to publish a description of this appliance, I discovered that it had been already devised, and was known as Nicholson's [illegible]ograph.

[illegible] of March 12, 1840, contains the paragraph:—

[illegible]provement in the apparatus for giving

and receiving the mail-bags from railway trains;" and in the next letter are sketches and descriptions. Someone had been sent on to the London and Birmingham Railway to make drawings of an appliance of this kind, which was there in use, designed by Mr. Dockray. Perception of its needless complexity led me to devise a simpler one, of which I had a working model made. It was the same as that which is now everywhere in use. Doubtless it was re-devised by someone else.

With the above extracts may be joined one which shows that the speculative tendency was occasionally qualified by the experimental. It is from a letter dated March 4, 1840:—

"I have been modelling a little in pipe-clay since I came from Derby [where I had been at Christmas]. I have finished one ornament composed of leaves of somewhat after the manner of the decoration in the old Gothic churches, and I have taken a cast in plaster of Paris. Not that it was worthy of such an honour, but merely for the sake of practice. . . . Jackson and I are proceeding vigorously with our chemical experiments. We devote two evenings in the week to manipulations, besides thinking over the phenomena between times. We had three other members when first the idea was started, but they have all dropped off."

Murray, the lecturer on Chemistry, had recently been at Worcester, and a letter shows that I, and probably also Jackson, had attended one of his lectures. This led to the making of the experiments above named. They were carried on in an attic over the office: subscriptions from some half-dozen having sufficed to purchase apparatus.

My father's letters written during this period from time to time called my attention to religious questions and appealed to religious feelings—seeking for some response. So far as I can remember they met with none, simply from inability to say anything which would be satisfactory to him, without being insincere.

How had this state of mind,

throughout our family, arisen? There were, probably, several causes. In childhood the learning of hymns, always, in common with other rote-learning, disagreeable to me, did not tend to beget any sympathy with the ideas they contained; and the domestic religious observances on Sunday evenings, added to those of the day, instead of tending to foster the feeling usually looked for, did the reverse. As already indicated in Part II, my father had, partly no doubt by nature and partly as a result of experience, a repugnance to priestly rule and priestly ceremonies. This repugnance I sympathized with: my nature being, indeed, still more than his perhaps, averse to ecclesiasticism. Most likely the aversion conspired with other causes to alienate me from ordinary forms of religious worship.

Memory does not tell me the extent of my divergence from current beliefs. There had not taken place any pronounced rejection of them, but they were slowly losing their hold. Their hold had, indeed, never been very decided: "the creed of Christendom" being evidently alien to my nature, both emotional and intellectual. To many, and apparently to most, religious worship yields a species of pleasure. To me it never did so; unless, indeed, I count as such the emotion produced by sacred music. A sense of combined grandeur and sweetness excited by an anthem, with organ and cathedral architecture to suggest the idea of power, was then, and always has been, strong in me—as strong, probably, as in most—stronger than in many. But the expressions of adoration of a personal being, the utterance of laudations, and the humble professions of obedience, never found in me any echoes. Hence, when left to myself, as at Worcester and previously in London, I spent my Sundays either in reading or in country walks.

In those days there was not any decided conviction propriety or impropriety of this course. Criti-

cism had not yet shown me how astonishing is the supposition that the Cause from which have arisen thirty millions of Suns with their attendant planets, took the form of a man, and made a bargain with Abraham to give him territory in return for allegiance. I had not at that time repudiated the notion of a deity who is pleased with the singing of his praises, and angry with the infinitesimal beings he has made when they fail to tell him perpetually of his greatness. It had not become manifest to me how absolutely and immeasurably unjust it would be that for Adam's disobedience (which might have caused a harsh man to discharge his servant), all Adam's guiltless descendants should be damned, with the exception of a relatively few who accepted the "plan of salvation," which the immense majority never heard of. Nor had I in those days perceived the astounding nature of the creed which offers for profoundest worship, a being who calmly looks on while myriads of his creatures are suffering eternal torments. But, though no definite propositions of this kind had arisen in me, it is probable that the dim consciousness out of which they eventually emerged, produced alienation from the established beliefs and observances.

There was, I believe, a further reason — one more special to myself than are those which usually operate. An anecdote contained in the account of my early life at Hinton, shows how deeply rooted was the consciousness of physical causation. It seems as though I knew by intuition the necessity of equivalence between cause and effect—perceived, without teaching, the impossibility of an effect without a cause appropriate to it, and the certainty that an effect, relevant in kind and in quantity to a cause, must in every case be produced. The acquisition of scientific knowledge, especially physical, had co-operated with the natural tendency thus shown; and had practically excluded the ordinary idea of

natural. A breach in the course of causation had come to be, if not an impossible thought, yet a thought never entertained. Necessarily, therefore, the current creed became more and more alien to the set of convictions gradually formed in me, and slowly dropped away unawares. When the change took place it is impossible to say, for it was a change having no marked stages. All which now seems clear is that it had been unobtrusively going on during my stay at Worcester.

Capt. Moorsom was a man of kindly nature, and felt much interest in the welfares of those who were subordinate to him. One of his ways of showing this is implied in the following passage from a letter to my father dated December 2, 1838 :—

"I forgot to mention to you in my former letters that we have a club, consisting of all the individuals belonging to the engineering department of the railway. We meet and dine together at Capt. Moorsom's every two months, and in the evening, subjects connected with the railway and previously fixed upon are discussed, every individual being allowed to make observations. We have a club-uniform which, by the way, I was forced to get rather against my will."

Very soon I took a share in the proceedings by reading a paper on the setting-out of curves, with designs for an instrument specially adapted for the purpose. Still-extant diagrams show that my method was bad. Instead of being one which continually divided and sub-divided the effects of inexact observations, it was one which continually multiplied such effects. A letter written home on May 26, 1839, says :—

"I am just about to commence a series of experiments upon kyanized timber, to ascertain its strength as compared with that of the wood in its natural state. This was delegated to me at our last meeting at Capt. Moorsom's."

Then, *à propos* of this same matter, there occurs in a letter, dated August, the passage which follows :—

"[illegible]y first attempt at a speech at our last dinner at the Cap-

tain's which occurred a fortnight since. We had arranged that our report upon kyanized timber [Bishopp had been joined with me] should have been postponed till the next meeting, and consequently I went quite unprepared; but finding that it was expected that I should say something I made a few observations and was gradually drawn into the subject and much to my astonishment without feeling any nervousness."

No results of any moment came out of the inquiry. No appreciable difference was found between the strength of wood which had been subjected to the action of bichloride of mercury and that which had not.

Any one who, on a certain morning towards the close of January, 1840, happened to be on the bridge which spans the Severn at Worcester, would have been much surprised had he looked over the parapet. In mid-stream, just below the centre arch, was a boat containing a man evidently charged to manage it. Attached to one of the thwarts next to the bow, was a rope-ladder. The upper end of this rope-ladder was fastened to the balustrade of the bridge; and, climbing up the ladder, was to be seen a young fellow of something like twenty, who appeared to be in a somewhat precarious position. What the meaning of the proceeding might be, a passing spectator would have been puzzled to say.

The young man, as will probably be inferred, was myself, and that I did not come to grief is astonishing. For, on the one hand, had the ladder been much inclined it would have twisted round and left me hanging to its under side; while, on the other hand, in proportion as its position approached the vertical, the strain exerted upon it by the boat held in a tolerably swift stream, joined with the strain of my weight, seemed very likely to cause breakage. I had, however, taken care to test the ladder well before using it. Its strength proved adequate, and I succeeded in my aim.

But what was I doing in so strange a position? still be the question. The explanation is co[illegible]

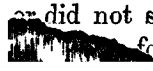
the following paragraph written to my father on January 18 :—

"You will remember our bridge over the Severn at Worcester. I have to-day been deputed by Capt. Moorsom to take the requisite dimensions for making a drawing of it during the course of the ensuing week. It seems that it is in contemplation by the Trustees to increase the width of the bridge, and I am to assist Capt. Moorsom in making an economical design for so doing."

Here occurred a temptation to independent thinking, and, as usual, the temptation was not resisted. There was, moreover, the usual lack of reticence—a lack which, had my superior not been very good-tempered, would probably have been injurious to me. For, while making drawings for a widening of the bridge in pursuance of Capt. Moorsom's plan, I suggested a plan which appeared to me better. He was not at all offended by my audacity; and it was agreed that both plans should be sent in.

And now there came a considerable change in the course of my life; entailing, alike, difference in abode and difference in occupation.

When I joined the staff at Worcester, the post of engineering secretary to Capt. Moorsom was filled by Mr. F. H. P. Wetherall, a son of Capt. (afterwards Admiral) Wetherall. Either because he had no faculty for engineering, or because he did not see how the functions he discharged under Capt. Moorsom conduced to professional advancement, he resigned: sometime in 1839. He was followed by a military man, Capt. Whitty—a gentleman who many years after became one of the Inspectors of Prisons. He, too, presently grew dissatisfied with the prospects afforded by his position. When, early in 1840, he left, one of our staff at Worcester was asked by Capt. Moorsom to undertake secretarial duties, and did so for a time; but, like his predecessors, he either disliked the work or did not see his way to benefit by it. Hence there re-



following letter :—

"DEAR SPENCER,—Bishopp does not fancy *doing Secretary* in preference to iron work. I therefore wish to offer the change of post for about a month or six weeks to you, and you will entirely use your own choice as to accepting it or not. If you come here it will be necessary to live at or near Powick, and lodgings are now vacant near this house, and you will have a finger in the pie for all that goes on, although your attention will be mainly directed to correspondence. . . .

"Truly yours,

"31st March, 1840. "W. S. MOORSOM."

I did not long hesitate to accept the post under the conditions named. A letter to my father, dated April 4, speaks of that day as the third of my initiation in secretarial work. It goes on to say:—

"Hitherto I have walked over in the morning; dined with the Captain; and returned after the conclusion of my duties.

"I think I shall receive much benefit from the few weeks drudging I am to have. Already I have rubbed off a great deal of my dread of correspondence; and as to my writing I find that instead of as heretofore having to urge my pen along with difficulty it now seems as though it were inclined to run away from me. . . .

"Our chemical experiments (or as Ramkin the office-keeper called them our *comical* experiments) as you may suppose are knocked on the head by my adjournment to *Pike* (Ramkin's edition of Powick). The apparatus, however, are remaining to take the chance of their being resumed."

As its statements imply, this letter refers to a transitional period of a few days—belonging neither wholly to my life at Worcester nor wholly to my life at Powick. But now all that follows, rightly comes into a new chapter.

CHAPTER XI.

SOME MONTHS AT POWICK.

1840. ÆT. 20.

ABOUT three miles out of Worcester, on the way to Malvern, lies the little village of Powick, just where the surface begins to rise out of the valley of the river Teme; and some quarter of a mile from the village, on the rising ground, stands the house, King's End, which was the residence of our engineer-in-chief, Capt. Moorsom. Between this house and lodgings in the village, my life for some few months was now to be passed. The following are extracts from a letter dated 15th April, 1840:—

"I am going on swimmingly with my duties as secretary; I suppose I wrote about eight or ten letters to-day besides endorsing some two or three times the number and sundry other little matters. Capt. Moorsom is treating me very kindly in every respect, it would hardly be possible to show more consideration and regard for my welfare than he is doing.

"He has (of his own accord) been advising me to practise levelling for the purpose of making myself familiar with the mechanical use of the instrument and has volunteered his own level (which has just been put in order) for the purpose.

"He takes every opportunity of pointing out what he thinks may be useful to me and invites me to come and sit with them in the evening whenever I feel inclined to do so. Mrs. Moorsom also acts in a very amiable manner upon every occasion. . . .

"I should very well like to pay a little attention to botany; but there are several reasons which militate against it at the present time—1st, I have to devote part of my spare time to the practice of levelling; 2nd, the Captain recommends me to study geology; and, 3rd, I have so many important books that I am anxious to purchase when I can spare money that I do not feel inclined to buy a work so very irrelevant to the profession. I don't mean to say that I do not think it worth

while to read Jussieu, but that it is only under present circumstances I do not deem it advisable. I am not so illiberal as to think any department of information unworthy of study. . . .

"I was thinking the other day that I should like to make public some of my ideas upon the state of the world and religion, together with a few remarks on education. I think, however, that I may employ my time better at present."

Merely noting that the last paragraph, amusing as coming from a young fellow not quite twenty, is at once illustrative of that self-confidence shown in so many other ways, and is curiously significant of things to come, I return to the first part of the letter. As I was treated with great cordiality by the chief, my position was a pleasant one. The amount of work was moderate; the leisure was available for country walks; and the spending of Sunday afternoons and evenings at King's End, afforded a social intercourse which my life for some years had lacked. A new experience should also be named—the establishing of relations with a number of children, with whom I soon became a favourite, as is shown by letters received from them after I went away.

Secretarial work was from time to time agreeably broken by journeys to different parts of the line—journeys on which I accompanied Capt. Moorsom in my official capacity. Drives in his gig, to Tewkesbury, Cheltenham, Gloucester, Bromsgrove, &c., varied by occasional expeditions I made on his behalf, to inspect, report, and transact matters of business, gave me many enjoyable relaxations.

Which was the best dictionary to buy, was an inquiry made in one of my letters to my father; and the inquiry reminds me of the need there then appeared to be for the use of one.

I have often wondered how it happened that up to so late a period, my spelling continued very defective. Letters written home from London and from Worcester

surprise me by the numerous errors they contain—most of them obviously due to inadvertence, but here and there one apparently due to ignorance. It is clear that I did not read my letters over before sending them, otherwise a large part of the errors must have been noticed and corrected; and that they were habitually sent off unread exemplifies my constitutional idleness. Now that, in search of an explanation of the mistakes ascribable to ignorance, I look back upon my antecedents, I recognize a sufficient cause. As shown in early chapters, my education was in but very small degree linguistic. No lessons had been given to me in English grammar, my father having, out of regard for my health, interdicted anything like pressure; and hence all the writing which accompanies grammar-learning was missed. So, too, the long continued efforts made, first at Derby and afterwards at Hinton, to gain some knowledge of Latin and Greek (which were accompanied by grammar-learning only to the extent of mastering the declensions and part of the conjugations, and by a little easy translation), were unaccompanied by any of the usual exercises. Hence, beyond such amount of writing as my mathematical culture entailed, none was needed save for letters home. There were, indeed, a few occasions on which my aunt made me write from dictation; but such discipline was not carried to any extent. So that it would, in fact, have been remarkable had I, under such circumstances, learned to spell correctly.

I do not understand how it happened, but my sense of [illegible]nsibility having been sufficiently aroused, the defect [illegible]me relatively inconspicuous. I did not buy a dic-[illegible]y until after my secretarial work had ended; and the [illegible]ce shows that there was comparatively little need for [illegible]f course such errors as had previously been caused [illegible]ness were now excluded: and, as for the rest, it

which was forthcoming when the demand for it became imperative.

As far back as I can remember my father had made style a subject of study—often amusing himself by taking up a book and making emendations on the margin; and now that a good opportunity occurred, he endeavoured to interest me in the subject. In a letter of his written the day before my 20th birthday, he says:—

"It is with composition as it is with virtue and holiness, no person sees the beauty of it till he begins to practise it. I am glad indeed that your eyes are beginning to open and to see what a great attainment it is to be able to write freely and well."

Some criticisms which I had made on a pamphlet recently published by my uncle Thomas, suggested this last remark; but nothing in the way of study came from this opening of my eyes. Not until, at the age of twenty-three, when there occurred to me an idea respecting force of expression, did the subject of style attract me. But then, having a theory to work out, I found all relevant books became interesting, and there presently resulted an essay on the subject. Sequences of this kind were characteristic of me.

Let me remark, in passing, that no great results can be counted upon from the study of style. One who is clear-headed, and who throughout life has daily heard well-framed speech, is pretty certain to have a style which is lucid if nothing more; and in the absence of either of these antecedents, the study of style will do but little. The most to be expected is that marked defects of expression and of arrangement may be rendered manifest in the course of revision. And, while not much can be done towards achieving correctness and clearness, still less can be done towards acquiring vigour, picturesqueness, and variety. Innate powers alone can produce these.

In place of narrative some extracts from letters will indicate the course of my life during April and

"Tomorrow we have an assistant coming—a gentleman named Capt. M———, who is, I suppose, about to enter the profession under the chief's auspices, and his employment as an introduction to engineering to consist in endorsing letters, &c., &c. . . . so that having him as *my Smike* (as the Captain calls him) I shall have a good portion of the work taken off my hands.

"Friday last saw a repetition of our engineers' meeting. . . . In consequence of my filling the berth of secretary I was, much to my surprise, requested by the chief to take one end of the table, and there being between twenty and thirty present the situation was no sinecure.

"Yesterday was spent in an excursion on the line. I started from this with the Captain in his gig at 9 A.M., and accompanied him to Bromsgrove, where after spending an hour or so in examining the works, and getting some refreshment, we parted—he proceeding onward to Birmingham and I occupying the remainder of the day in walking back along the line.

"These, you see, are pretty good proofs that the Captain has not fallen off in his kind treatment. . . . He is, in fact, the best specimen of a perfect gentleman that I have ever come near. Mrs. Moorsom, also, is quite as worthy of admiration in her conduct to all around her. I spent the whole of Good Friday with them, and taking the average since I have been here, I pass about two evenings in the week at their house.

"The affair of the Severn Bridge is now under consideration by the trustees, and the result will be known next Tuesday. The proposition appears to have been very favourably received from the account Capt Moorsom gave of the proceedings, and he says that my design is to be adopted if they conclude to execute the improvement. So that you see he has not stopped short in his disinterested conduct on this point."

Then follow two pages of description and argument concerning a plan I proposed for testing the qualities of the waters to be employed for locomotives: the notion being that, instead of ascertaining the amount of impurity by analysis (the nature of it being relatively unimportant), it might be ascertained by "that modification of the hydrometer called the areometer or delicate measurer." In a letter of 4th May is the following:—

ave just commenced an article on my theory of trussed beams
ust occurred a very good opportunity of bringing it forward
r series of remarks on an article in the last number of

ake some experiments for my own satisfaction and
e of making out a clear case."

A diary of some days well exhibits one of the interludes of my life at Powick. A partial opening of the line was about to take place:—

"Monday—Hurry scurry till 1 P.M. to get through business before starting—set off in the gig with Capt. M. to Eckington (15 miles from Powick); from thence to Cheltenham by one of the local trial trains—slept at Cheltenham.——Tuesday—To Eckington and back (24 miles) by morning trial train.—Transacted secretarial work on return—walked on line to look at works—went to Tewkesbury (10 miles) from Cheltenham by railway to make arrangements for finding friction of locomotive. (In the afternoon we happened accidentally to have two engines going the same way on the two lines of rails, and a race was the consequence—went side by side at between 30 and 40 miles an hour for a mile or so, and shook hands from one train to the other)—slept at Tewkesbury.——Wednesday—Made some arrangements for experiments on loco.—went to Cheltenham (10 miles)—took measurements of evaporating surface—went through secretary's work—ran to and fro with engines—returned to Tewkesbury and slept there.——Thursday—Experiments on friction—walked to Bredon to meet trial train—went from there to Cheltenham—accompanied Capt. M. to Gloucester in the gig—transacted correspondence, &c., and looked over works at Gloucester—returned to Cheltenham—dined, and went down with evening trial train to Eckington—returned to Cheltenham—drove Capt. M.'s gig to Tewkesbury (horse ran away and went at a gallop for a mile and a half; took it quite coolly and let her go on till she was tired)—slept at Tewkesbury.——Friday—Finished off experiments—Captain arrived from Cheltenham at 10—by his request set to work to design an arrangement for taking a line of rails from station down to the quays on the river side; propose to make alteration in the bed of the river, &c., to facilitate arrangements—returned with him in the gig to Powick and worked till 8 this evening to get matters straight."

It was about this time, namely, the beginning of June, that Capt. Moorsom displayed at once his kind feeling and his good opinion of me by a letter to my father. Its expressions were such as gave great pleasure to both of us: my father's pleasure being especially shown in the reply, of which he sent me a copy. Capt. Moorsom's letter, however, is nowhere to be found. It was, I fear, not, taken great care of; and, as sometimes happens in such cases, has disappeared. It is quite as well

for, had it been extant, I should have been in great doubt whether to quote it or not to quote it.

Though a little out of chronological order, I may perhaps better here than elsewhere include an incident which shortly afterwards occurred. It is indicated in the following letter:—

"Dear Spencer,—Will you go with me to the Deepdene? We shall probably go up from Cheltenham to London this evening and return so as to be here on Wednesday morning—but we *may* be detained till Thursday.

"If you accede to this I will have the gig ready for you here at 9½ A.M., and you can take it it into Wor'ster and we will start thence about 12¾.

"Truly yrs.,
"W. S. Moorsom."

For the tentative expression of this note, the reason was that this expedition to Deepdene was a *hors d'œuvre*. My engagement with the Birmingham and Gloucester Railway, of course, did not include taking part in any other work which Capt. Moorsom engaged to do; and probably it was the consciousness of this which led him to ask rather than to order.

Writing to my father from Powick, on 2nd July, I said:—

"I have never seen any place I like so well as this said 'Deepdene.' A week would have passed very pleasantly away in looking over the house and strolling about the grounds. I remained in the mansion during my two days' stay and had consequently plenty of opportunity of looking over the collections of paintings and sculpture."

Of the work which Capt. Moorsom had undertaken to design and superintend for the owner of Deepdene—at that time the well-known H. T. Hope, M.P., author of *Anastasius*—a part was the building of an ornamental wooden bridge over a lane which runs through the park. Of this I had made the drawings, and while at Deepdene staked out the foundations. When at Dorking 50 years after, I made inquiries concerning this bridge, but found that alterations in the grounds had caused removal of it.

Some pages back reference is made to certain proposed experiments in verification of a theory of trussed beams. A letter of June 6, however, describes something quite unlike a verification. It runs:—

"Last night I made the experiments on trussed beams which I mentioned to you. The results, however, have quite disconcerted me, and appear, as far as I can see, to throw my theory to the winds. Not that the strengths are different from what I had expected, for I have not yet had time to see how they would agree with my hypothesis, but that the appearance of the fracture does not bear out the position I had assumed."

Doubtless it was well to have occasionally a positive disproof of my conclusions. There needed no fostering of self-confidence, but rather the reverse.

This quotation and this comment fitly serve to introduce the fact that during these months there had been going on the usual speculative activity, ending now in theoretical and now in practical results: the last being predominant. Let me first name the purely theoretical ones.

It may be remembered that an early chapter states that when seventeen I hit on a geometrical theorem of some interest. This remained with me in the form of an empirical truth; but during the latter part of my residence in Worcester, responding to a spur from my father, I made a demonstration of it; and, now that it had reached this developed form, it was published in *The Civil Engineer and Architect's Journal* for July, 1840. It is reproduced in Appendix B. I did not know, at the time, that this theorem belongs to that division of mathematics at one time included under the name "Descriptive Geometry," but known in more recent days as "The Geometry of Position"—a division which includes many marvellous truths. Perhaps the most familiar of these is the truth that if to three unequal circles anywhere placed, three pairs of tangents be drawn, the points of intersection of

the tangents fall in the same straight line—a truth which I never contemplate without being struck by its beauty at the same time that it excites feelings of wonder and of awe: the fact that apparently unrelated circles should in every case be held together by this plexus of relations, seeming so utterly incomprehensible. The property of a circle which is enunciated in my own theorem, has nothing like so marvellous an aspect, but is nevertheless sufficiently remarkable.

Of the more practical results of the speculative tendency some are described in a letter of 25th June:—

"I have two very nice little contrivances to explain to you but do not know whether I shall be able to enter fully into the detail.—The first (which is not theoretical, for I have already put it in practice) is a little instrument for showing by inspection (with the necessary data) the velocity of an engine—That is to say, suppose an engine and train goes up a gradient of 1 mile 37 chains long in 2 minutes and 27 seconds, what is the velocity per hour? This instrument shows it by merely adjusting the scale to correspond with the above data. . . .

"The principle is very simple (being only another application of that valuable proposition the 6th in the 6th B.) and you no doubt see the application at once."

A description and drawing of this instrument will be found in Appendix C under the name "Velocimeter": an illegitimate name but a convenient one. The letter from which the above paragraph is quoted, continues as follows.

"When I gave the one I have made to Capt. M. he was inclined to say that I had been uselessly expending my time in making an instrument which was of little practical use, until I reminded him that had Bishopp (one of the staff who has been superintending the trials of the 'Americans') had such an apparatus it would have saved him between one and two thousand such calculations as the one I have given as an example, and a good portion of a week in time.

"I find that I shall not be able to discuss the second one till my next, so I will only tell you that it is an instrument for measuring the tractive force of a locomotive engine whilst drawing a train under all the varying circumstances of different gradients, velocities and loads, . . . that the instrument is hydrostatic [hydrodynamic I ought to have said] and that the index will be the compression of a column of air in a glass tube (a column of mercury being interposed between the

water and air): the principle is such that the index will give the medium of all the irregularities of pull."

A subsequent letter contains drawings of the proposed apparatus, but nothing came of the idea. I had no opportunity of carrying it out.

One other appliance, though some months subsequent in date of origin to the Velocimeter, may conveniently be named here. I called it a Scale of Equivalents. In the course of the experiments on the strength of kyanized timber named in the last chapter, there arose the need for changing the denomination of the measurements taken. They had been set down in inches and tenths, and it was decided that they should be reduced to tenths and hundredths of a foot. Having a dislike to the mental labour which the required calculations implied, I was prompted to find a method of effecting the change in an easier way. The simple appliance which served for this special purpose was afterwards developed into a more complex appliance available for general purposes of many kinds.

I described this "Scale of Equivalents" in an article which, sometime after, was sent to *The Civil Engineer and Architect's Journal*. It was not published, for the reason that making the lithographed illustration would have entailed too great a cost. No account of the instrument anywhere exists; and I have therefore thought it well to give one. See Appendix D.

À propos of the foregoing details it is proper that I should here reproduce a passage written by my father to me on July 3rd:—

"I am glad you find your inventive powers are beginning to develope themselves. Indulge a grateful feeling for it. Recollect, also, the never-ceasing pains taken with you on that point in early life."

The last sentence is quoted not only in justice to my father, but also as conveying a lesson to educators. Though the results which drew forth his remark were in the main due to that activity of the constructive imagination which I

inherited from him, yet his discipline during my boyhood and youth doubtless served to increase it. Culture of the humdrum sort, given by those who ordinarily pass for teachers, would have left the faculty undeveloped.*

With the approach of midsummer came an experience wholly unrelated to engineering, and but indirectly related to the life of the last three months—an experience which was quite new to me.

Mrs. Moorsom and family had gone in May to Ryde, in the Isle of Wight, and during the early part of June Capt. Moorsom had been for a time staying with them. When June was nearly half through, business brought him back for a few days, and with him came a relative—a lady about my own age. The pressing affairs having been attended to, he again joined his family at Ryde, leaving this visitor sole mistress of the house for the ten days or so which followed. Of course we had been duly introduced during the Captain's brief sojourn: the introduction making me acquainted with a young lady sufficiently good-looking, though not perhaps a beauty, but intelligent, unconventional, amiable, and in various ways attractive. Whether Capt. Moorsom supposed that she would restrict herself to the rest of the house, or whether

* Let me name a significant fact, published while the proof of this chapter is under correction. In *The Speaker* for April 9, 1892, Mr. Poulteney Bigelow gives an account of an interview with Mr. Edison, the celebrated American inventor. Here are some quotations from it:—"To my question as to where he found the best young men to train as his assistants, he answered emphatically—'The college-bred ones are not worth a——. I don't know why, but they don't seem able to begin at the beginning and give their whole heart to their work.' Mr. Edison did not conceal his contempt for the college training of the present day in so far as it failed to make boys practical and fit to earn their living." With this opinion may be joined two startling facts: the one that Mr. Edison, probably the most remarkable inventor who ever lived, is himself a self-trained man; and the other that Sir Benjamin Baker, the designer and constructor of the Forth Bridge, the grandest and most original bridge in the world, received no regular engineering education.

he foresaw that she might occasionally visit the room which served as an office, I do not know; but this last result soon occurred. How it occurred I cannot remember. Probably the bringing of letters became the occasion for a "Good morning." Presently this daily salute grew into something more, until by-and-by the greater part of the day was spent by us together in the office.

Of course the intimacy which thus sprang up with one just growing into womanhood, was extremely agreeable; the more so because my previous life had kept me almost wholly out of female society. As I had no sisters, there had been no visits of girls to our house, and no visits on my part to houses where there were girls. Though, while at Hinton, I had sometimes seen the sisters of one of my fellow-pupils, P——, whose family resided in Bath (concerning one of whom, a very beautiful girl, her brother occasionally quizzed me, not without reason), yet, practically, this intercourse which now commenced in the study or office at King's End, was my first experience of anything more than mere formal meetings.

That Capt. Moorsom should have been so incautious as thus to leave two young people together without restraint or oversight, surprises me when I think about it. Possibly, knowing she was engaged, he thought that the pre-existing relation would furnish a sufficient check. But, if this was his thought, he did not duly consider me in the matter: leaving me unguarded by the knowledge. However, no harm of any kind happened, notwithstanding the length of time we daily passed together. Her society was doubtless beneficial; though not, perhaps, conducive to the fulfilment of duties. Probably, among other effects, it tended to diminish my *brusquerie*. An incident proves that this was conspicuous. One day, after some speech of mine, she remarked—"If anyone else had said that, I should have been offended." This, while it implies my bluntness, also shows how quickly it had become manifest

that it was my habit to utter thoughts with but little consideration; and shows, too, how readily, when this trait is recognized as innate, things which would ordinarily imply intentional rudeness, are accepted as matters of course.

After the return of the family, and before any entanglement of feeling occurred, there came on a visit the young gentleman to whom she was engaged: then an undergraduate at Oxford. When, one Sunday afternoon, we sallied out for a walk with the children, she, taking his arm, looked over her shoulder smilingly, and rather mischievously, to see what effect was produced on me: there being an evident suspicion that I should not be pleased. The revelation was not agreeable to me; but still it did not give me a shock of a serious kind. Matters had not gone far enough for that.

The stay of this young lady at Powick became greatly extended, and during the rest of my engagement on the Birmingham and Gloucester Railway, which was fully three-quarters of a year, we remained on a friendly footing, and letters occasionally passed between us. One of them may fitly be quoted, partly because it shows the kind of relation in which we stood, and partly because it indicates a certain opinion which I already entertained.

"Powick, 18 Nov., '40.

"MY DEAR MR. SPENCER,

"You sent me a few days ago a decidedly unofficial letter, and I now propose to send you one which will come under the same denomination. You will, perhaps, be inclined to say I am interfering with what is no concern of mine, but I trust the importance of the subject will excuse the presumption, if it is such—I have just heard from E—— that our ideas respecting the preservation of our friends with regard to the late dreadful accident at Bromsgrove do not at all accord, and I was much surprised to hear that you disagree with the opinion that all events in this world are under the direct surveillance of the Almighty—Mr. Hughes, who was here to-day, says that he, Mr. and Mr. Creuze, had intended to be upon the engine but were Cofton, and he added that they had even determined as s hot, to stand upon the steps, and had they done so his they must have experienced the fate of poor Scaife.

"I do not think you can really be of opinion that the God who 'numbers the very hairs of our head,' was in this case indifferent to the fate of his servants, or that his goodness and mercy is not conspicuous in their preservation from the dreadful fate which would probably have overtaken them.

"Forgive me if I have offended you by this letter. I assure you I had no wish but your good in writing it, which I hope you will believe and also consider me,

"Your very sincere friend,

"——— ———."

Such small skill as I had with my pencil—a certain mechanical accuracy in representation, without any trace of genius—had, during the summer, been utilized in making portraits of the Moorsom children; and now this small skill was further utilized in making a portrait of this young lady. All the preceding sketches had been profiles, but this was a three-quarter face, the only one I ever did.

It was pretty clear that had it not been for the pre-engagement our intimacy would have grown into something serious. This would have been a misfortune, for she had little or nothing, and my prospects were none of the brightest.

She did not marry the gentleman to whom she was at that time engaged. Some three years later she announced to him that she found herself unfit for the duties of a clergyman's wife. Eventually she married her cousin, the squire of the parish of which her father had been rector.

Returning now from this episode to the general narrative, let me reproduce a significant passage from a letter of July 12, concerning my course after the close of my career on the Birmingham and Gloucester Railway:—

"Now I always had, and have still, as sanguine hopes with regard to your electro-magnetic machine as you have. I therefore propose to come home and to set to in earnest to study and experiment on the ject and to do my best with your assistance to perfect the in

The passage thus written in the summer of 1[illegible] because of its bearing on the course pursued [illegible]

Towards the end of July a sudden change of occupation, accompanied by change of residence, occurred, caused by the issue of a law-suit. On the Lickey incline, some short distance above the station at Bromsgrove, a road cuts the railway obliquely. Memory would have led me to say quite positively that the road passed by a level crossing, and that the local authorities had entered an action against the company for the purpose of making them build a bridge; but letters prove a failure of memory, for they show that the result of the action was to force the company to build a better bridge than they had done.

However, causes and details aside, the result was a migration from Powick to Bromsgrove for the purpose of superintending the works. The business was pressing: the date for opening that part of the line having been fixed.

CHAPTER XII.

A NOMADIC PERIOD.

1840—41. ÆT. 20—21.

FROM Bromsgrove, on 27th July, I wrote home describing specifically the nature of the task thus suddenly entered upon.

"I am engaged in superintending the pulling-down and re-erection of a large bridge under the inclined plane at Bromsgrove. It is to be completed within three weeks and four days from the commencement of the pulling-down, and rather more than one week has already passed. I have had to make out the drawings, estimate, &c., and to see to the details of the work during its progress. . . . I believe it will be done in time. The contract is between one and two thousand pounds."

A subsequent letter, written after the completion of the new bridge, says:—

"You quite mistake as to the usual system of work on railways. The greater proportion of the work done at the bridge was by contract, and I had nothing to do with the men except to see that they did the company justice. All the timber work and fitting and fixing girders was, however, done by day-labour under my own instruction. Perhaps about half the cost of construction was in this case done by me and entirely after my own designs (Capt. Moorsom not interfering in any way); but this was an extreme case and the usual laws were broken through: day-work being strictly prohibited on this railway."

I had forgotten the fact named in this passage—that the responsibility for the design rested with me. It seems needful to explain how so makeshift a structure originated; lest I should be blamed for bad engineering by any one who, being in the neighbourhood, happens to see

bridge (if it still exists). The time allowed was so small that there was no possibility of designing fit girders and having them cast. Such girders as had been designed for other purposes, and could be obtained forthwith, were consequently used. These were, however, too short to span the width of the road obliquely; and the result was that a framework, partly of these girders and partly of strong timber balks, had to be made. I was a little nervous about it, but it proved strong enough. Possibly it has, during these fifty odd years, been replaced by something more workmanlike.

Here is a passage written home on the 23rd August, indicating another impending change.

"I left Bromsgrove yesterday, having so far completed my work as to allow of my return to Powick. I do not however remain here. I go to-morrow to join Mr. Hughes to assist him in finishing up the work of the G. division, and to complete sundry works which the Subs have left undone. [Some little time before, the works having been mainly completed, the sub-engineers on the G. division had ended their engagements.] I do not expect to have a very pleasant time of it. . . . I expect, however, it will be a great benefit to me in one respect. I have always had a great horror of confusion, and never could bear anything that was not clear and straightforward; but if I go through all that I believe is before me, I imagine that I shall pretty well get over this failing."

The prospect of this confusion so far perturbed me that I thought resignation of my post might be needful. But my alarm was groundless.

Among the various small extra works, completions, and repairs, between Bromsgrove and Gloucester, which I had to see executed—making contracts, and having the works properly done—the only one which I remember as of considerable importance, resulted from the imperfect construction of the bridge over the Avon at Defford. Capt. Moorsom had no doubt originally made rather an underestimate of the cost of the line, as engineers ordinarily do; but he was creditably anxious to keep within the estimate,

and hence was over-prone to economy of construction. In some cases the effects were disastrous; and, among the mischiefs, was the giving way of one of the wing-walls of the Defford bridge. Pulling-down and re-building of this had to be achieved without interruption of the traffic: one of the lines being closed and the trains diverted on to the other. A large gap in the embankment was necessitated; and the available line of rails was shored up. The proceeding was somewhat risky, and entailed on me considerable anxiety. No accident happened, however.

My miscellaneous activities during the autumn had their disciplinary effects. Much business devolved on me, and probably the experience then obtained in carrying out many transactions, and dealing with many men, was permanently advantageous. Here is an extract relating to this period:—

"I have been doing a good deal of surveying lately and rather like it as a variety in my usual drudgery. My time is come to a close—I have been writing whilst waiting for a contractor, and he is now come."

Walks hither and thither about the line were of course necessitated; and these usually had castle-building as their concomitant. Already an early chapter has shown how much given I was to this tempting form of mental activity, commonly thought so dissipating; and the habit established in boyhood was still strong.

It goes without saying that the air-castles built at this time were of a different style of architecture from those built in early days—no longer took the form of Robinson Crusoe adventures, or incidents such as those which the reading of novels of the Mrs. Radcliff type had in early days suggested. Naturally day-dreams now took a certain colour from the actualities of my life and the possibilities of its future. As the foregoing pages show, inventions of one or other kind were commonly in my thoughts;

and the almost necessary result was that making a fortune by successful inventions mostly formed the subject-matter of my imaginations. Whether I became so absorbed in these imaginations as to talk to myself in the way that I did during boyhood, must remain an unanswered question; for since, on the line between stations, there were no passers by to show their surprise by staring at me, as sometimes happened in the streets in earlier years, I may have soliloquized without being made aware of it. Probably, however, the increased reticence of approaching manhood checked this habit of unconscious speech.

While referring to this castle-building as at that time habitual, it is worth remarking that there was no approach made to any such ambition as the writing of books. In those days there had not arisen the faintest idea of becoming an author, still less of undertaking such a task as that which I commenced when forty.

Part of the Birmingham and Gloucester Railway passes through the blue lias clay, which is rich in fossils. There were always lying about in the Worcester Office, samples of ammonites and other forms of secondary molluscs, which it had yielded; and on these I had gazed with interest. Marvellous remains of ammonites some of them were; or, rather, not of ammonites at all, but preserved casts of their successive chambers, curiously inter-locked. Now that rambles about the line gave me facilities, I was gradually led into the study of Geology—a very superficial study, however. Writing on the 26th September, I said:—

"I have been taking a good deal of interest in fossil-remains lately, and have been collecting a few specimens. I saw portions of several Plesiosauri in a lias quarry yesterday. One specimen was covered with what I believe to have been a portion of skin. It followed the outline of the bones beneath and had a rough, irregular surface such as you would suppose the covering of such a creature would have. It was too large to bring away, and too much mutilated to be worth it. I carried off several vertebræ, however. I was much pleased in

discovering the other day what I believe to have been the intention [!] of the transverse ribs in the shell of the ammonite."

This gathering of fossils was a resumption, in a new form, of my habits as a boy. Making a collection is, indeed, the proper commencement of any natural history study; since, in the first place, it conduces to a concrete knowledge which gives definiteness to the general ideas subsequently reached, and, further, it creates an indirect stimulus by giving gratification to that love of acquisition which exists in all.

One result was the purchase of Lyell's *Principles of Geology*,—a work then recently published. I name this purchase chiefly as serving to introduce a fact of considerable significance. I had during previous years been cognizant of the hypothesis that the human race has been developed from some lower race; though what degree of acceptance it had from me memory does not say. But my reading of Lyell, one of whose chapters was devoted to a refutation of Lamarck's views concerning the origin of species, had the effect of giving me a decided leaning to them. Why Lyell's arguments produced the opposite effect to that intended, I cannot say. Probably it was that the discussion presented, more clearly than had been done previously, the conception of the natural genesis of organic forms. The question whether it was or was not true was more distinctly raised. My inclination to accept it as true, in spite of Lyell's adverse criticisms, was, doubtless, chiefly due to its harmony with that general idea of the order of Nature towards which I had, throughout life, been growing. Supernaturalism, in whatever form, had never commended itself. From boyhood there was in me a need to see, in a more or less distinct way, how phenomena, no matter of what kind, are to be naturally explained. Hence, when my attention was drawn to the question whether organic forms have been specially created, or whether they have arisen by

progressive modifications, physically caused and inherited, I adopted the last supposition; inadequate as was the evidence, and great as were the difficulties in the way. Its congruity with the course of procedure throughout things at large, gave it an irresistible attraction; and my belief in it never afterwards wavered, much as I was, in after years, ridiculed for entertaining it.

The incident illustrates the general truth that the acceptance of this or that particular belief, is in part a question of the type of mind. There are some minds to which the marvellous and the unaccountable strongly appeal, and which even resent any attempt to bring the genesis of them within comprehension. There are other minds which, partly by nature and partly by culture, have been led to dislike a quiescent acceptance of the unintelligible; and which push their explorations until causation has been carried to its confines. To this last order of minds mine, from the beginning, belonged.

During all this time, though moving about on the line, I was stationed at Powick; so as to be able to receive instructions from Capt. Moorsom. In the autumn there arrived a youth, E. A. B——, brother of the gentleman to whom Miss —— was engaged, with the hope of getting some knowledge of engineering. We became friends and remained so for years; carrying on a correspondence. With a plodding nature, but nothing brilliant about him, he succeeded well in life: better, indeed, than many of greater capacity—as often happens, for the world wants chiefly mechanical services. Our intercourse was pleasant, and led to much discussion: that, indeed, being a usual result whoever might be my companion. There were plenty of points of difference between us, and these continued to manifest themselves during the correspondence of subsequent years.

This mention of E. A. B—— is in part suggested by

remembrance of the circumstances which led to his departure. Capt. Moorsom, about to finish very soon his work on the Birmingham and Gloucester Railway, had found something to do in Cornwall. He was employed, by gentlemen locally interested, to make a survey of a line which was to be called the Exeter and Falmouth Railway. This survey was in course of execution during the latter part of 1840. Among others, E. A. B—— was drafted on to the staff; and my old friend Jackson, who had resigned his post at Worcester early in the year, came from London to aid in this new scheme, which promised to furnish posts to sundry of those who were shortly to receive their *congés* at Worcester. Being detained by Birmingham and Gloucester work, I had nothing to do with the survey; and, except at the last, did little beyond volunteering a design for a species of bridge, which it occurred to me would be desirable for spanning the many narrow and deep ravines to be passed over by the line. The capital obtainable for the projected railway was not likely to be large, and this type of bridge was specially designed with a view to cheapness. It was taken by Capt. Moorsom to Cornwall, and, I believe, was adopted in making the estimates. An account of it, with drawings, was published in *The Civil Engineer and Architect's Journal* for July, 1841. Reproduction of this among the appendices, is undesirable because it is of too exclusively professional an interest.

During his stay in Cornwall my friend Jackson wrote me a letter, of which some passages have interest.

"I have to apologise to you about the sketch [to be given to me as a remembrance]. It was very nearly completed when Capt. M.'s letter came requiring my attendance. I can assure you I have not forgotten you and yours and the many pleasant hours we have spent together. I wonder whether we shall *ever* meet again. It is a word full of meaning, and when I think of it it dullens me. However, the future is wisely hid and time alone can reveal it. I have heard much news from E. A. B—— about your innocent flirtations, your philosophic

theories, your varied improvements, and lastly, not least, your everlasting grumblings. . . .

"I suppose that as you are away from Worcester and Powick you will look out for some one else upon whom to bestow your smiles. How different from what you were when first I knew you. Shall I call it an improvement? Never mind, I won't bother you any more. . . .

"How is your collection of fossils? I hear that they are all confined in a large box big enough to contain yourself when you choose to make it into a travelling bedstead."

At a later date, as above hinted, I took a considerable share in getting up the plans of this Cornish line at the office at Worcester. Whether the scheme went before Parliament and was thrown out on Standing Orders, or whether it never got so far as that, I cannot remember. But, whatever may have been the cause, the line was not made; and there was disappointment for those who had hoped to be employed on it.

In strict chronological order there should before have been named the fact that during the summer, while still acting as engineering-secretary to Capt. Moorsom, I saw something of the testing of locomotives. Commencing at Bromsgrove, and ascending some two or more miles towards Birmingham, there is a portion of the line called the Lickey Incline, having an inclination of 1 in 37. For the drawing up of trains, special locomotives had been imported from America—locomotives of great power considering their small size; and, on various occasions, we had trials of them at which I was present. Towards the close of the year, there hence resulted another change in my occupation. A letter of 8th December says:—

"I am very doubtful, now, whether I shall be able to come to see you at Christmas, and if I do come it will be only for a day or two. This change in my anticipations is caused by my having to take the place of Mr. Bishopp in the superintendence of the trials of engines. He has just been transferred to the permanent service, and will not have time to attend to this in conjunction with his other duties. I believe there will be three more American engines and four English

ones to try, each of them taking from a week to a fortnight. Several of them are now ready, and there will be no excuse for delay, so you must make up your minds to see me for a very short time, if at all."

Some of these testings were commenced while the engines were being brought up to Birmingham from the works of the makers. Hence the following sentence dated January 18:—

"I have been twice into Lancashire since I wrote to you. . . . The first of the above trips terminated in a most complete catalogue of disasters. We were detained about four hours on the coldest day of the whole frost, in the middle of Chat Moss, in consequence of a trifling accident to the engine boiler, and on the next day, shortly after leaving Warrington, the engine burst a tube, which terminated the second day's adventures."

The engine which thus came to grief had been made by Mr. James Nasmyth. Before setting out with it, I had been over his works at Patricroft, near Manchester, and had seen various of his labour-saving machines. I think the steam-hammer had at that time been invented, and have a vague recollection of seeing one at work; but this is a case in which I really cannot distinguish between memory and imagination. Mr. Nasmyth was then known only in the engineering world, but subsequently became known as an amateur astronomer, and some thirty years ago created a sensation in the scientific world by his supposed discovery of the willow-leaf-like structure of the Sun's surface. Subsequent observations, however, proved that he had been under an illusion.

I am reminded by a letter that during this occupation with the testing of engines, or rather during the intervals from time to time spent in reducing my observations to tabular form, the little instrument before named, the velocimeter, proved of service in economizing the time and labour of calculations which I had to make.

This change of occupation entailed a change of residence. Bromsgrove, the locomotive centre, was a more

convenient place for me. Hence to that place I removed from Powick before the 10th December, and remained there until the middle of March: not, however, being continuously occupied in making trials of locomotives. This is shown by the following passage written on February 4, 1841. The first line refers to the alarm felt at home.

"There is no more danger of my being hurt by the engine trials. The directors have decided that in consequence of the urgent want of train-engines on the line the new engines shall be at once handed over to Mr. Creuze, and have notes taken of their performances during the ordinary service. The whole affair is therefore now out of my hands, and I am about to employ my time in making drawings of the "Philadelphia" engine [one of the American engines] for the Institution of Civil Engineers."

My new residence proved otherwise convenient. Bromsgrove was better adapted than Worcester for getting made some parts of an apparatus which I had devised. Already, at the close of the last chapter, was named the fact that my father had suggested a mode of utilizing electro-magnetic action; and, during the latter part of 1840 and beginning of 1841, letters contain discussions concerning the details of an engine to be made in pursuance of it. It was, I believe, the action of a muscle which suggested to my father the thought of this engine: the action of a muscle being one in which a large motion is obtained by the accumulation of many small motions. Electro-magnets, placed at short distances from one another, were to be so mounted that when excited they would severally move, each towards its neighbour: the result being that a series of them fixed at one end, would produce a movement at the other end made up of all these small movements united. It was manifest that the magnets must be numerous and at short distances; and the difficulty was to get a sufficient number of them in a moderate space. I proposed circular disks; each being made of a form somewhat like that of the bobbins used in lace

machines for containing the threads of cotton: the space which in them is occupied by threads of cotton being, in these disks, occupied by the exciting wires. Various difficulties were thought of, and various plans for overcoming them—plans which, on now contemplating them, it seems to me would have been futile.

I was so far sanguine, however, that while at Bromsgrove I superintended at leisure the making of a considerable number of these disks; prompted by the thought that, when the leisure time came, we should be enabled to make the experiment with less delay.

I say "when the leisure time came," for there was approaching the termination of my engagement. The greater number of those who had been employed on the Birmingham and Gloucester Railway had gone; and now I, too, had received a notice that after April 25 my services would no longer be required. Concerning this notice, a letter home dated 4th February says:—

"I was really quite pleased when the chief told me that he was about to send it; so much so, that I could not help showing it—rather to his astonishment I fancy."

Clearly, part of the satisfaction thus displayed was due to my hopes concerning the electro-magnetic engine, for the next paragraph says:—

"This last fortnight I have been getting together the necessary apparatus for the electro-magnetic experiment, and I expect to be able to make it in a few days";

an expectation, however, which was not fulfilled. Another paragraph of this same letter, treating of a totally different matter, may not unfitly be quoted:—

"I was much pleased the other day to find how much I had increased in weight lately—actually gained 15 pounds since last August: my total weight now being 150 pounds. I feel pretty well convinced that this is the cause of my having been so stupid for the last half year."

Leading an outdoor life, free from any considerable mental strain, and living chiefly at hotels on abundant

and varied fare, probably caused me to reach this weight —a weight which I never again reached until quite the close of life. The change of appearance which accompanied this increase of weight, was, like the mental change, not to my advantage; as the remarks of my friends proved.

Returning to the matter of my engagement, or rather disengagement, it should be added that I declined a permanent post which was offered to me. After giving some particulars of an accident by which the engineer of locomotives (Mr. Creuze, a Cambridge man, who narrowly missed the Senior-Wranglership) was scalded to death, a letter of April 11 says:—

"It was in consequence of this occurrence that the chief the day before yesterday offered me a situation in the permanent Loco. service. I refused it, however, without even inquiring what it was, and I have plenty of reasons for having done so. Although I did not inquire the particulars, there is no doubt as to these. The office would be that of assistant Loco. engineer in place of Bishopp [also a Cambridge man], who will now be promoted to Creuze's place. I should, however, consider this, were I to take it, a loss of time, and detrimental to my future progress in that respect. The chief was rather astonished at my calmly refusing the offer."

I did not much like the position to be filled; but beyond this, and beyond the cause already intimated, there was another cause operating—a cause which, as a matter of policy, I ought not to have been influenced by.

Some feeling of alienation from Capt. Moorsom had been produced in me by certain recent incidents. My friend Jackson, who was one of those employed in making the survey of the Cornish line, had not been, as he considered, well used; and since he was by nature an uncomplaining man, I concluded that there were good grounds for the feeling he displayed. The sum available for making the survey had been small, and those who took part in it were no doubt stinted in the payments they received. Probably Capt. Moorsom's idea was that, were the Act

obtained, and the line made, those who had aided would receive compensations by their subsequent engagements. Beyond the unsatisfactory treatment of my friend, which I somewhat resented, there were, I thought, some proceedings not altogether equitable in the getting up of the survey; and letters show that my views about them were expressed somewhat openly. But some facts overlooked ought to have greatly qualified these views.

It is a trite observation that, at the time of their occurrence, one's feelings and acts are often not seen in their proper proportions; and that it remains for subsequent years to bring right estimates of them. Whenever, in later life, I have looked back on those days, it has been clear that the alienation then displayed, and which afterwards influenced me, was not altogether defensible. Even supposing that I was entirely right in my judgments on the transactions referred to, the sentiment caused over-rode too much the other sentiments which should have been dominant. Remembering the kindness Capt. Moorsom had shown all through our relations, which was great considering the absence of any claim on him, such disapprobation as I felt for what did not seem equitable but which after all may have been well warranted, should not have been allowed to outbalance the feeling of gratitude. In this case, as in other cases, was shown the predominance of that most abstract of the sentiments—the sentiment of justice. Its supremacy over the other moral feelings, is such that when it has been offended there results almost an obliteration of what good opinion I otherwise have had reason to form of the offender. This seems to be one of the results of a mental constitution which has largely influenced my life and thought, and shows itself in my writings; but which, however needful in one who has to do a certain kind of work, is not the most desirable otherwise considered. In most men, personal considerations conquer impersonal ones: in me the contrary happens.

And this sway of the impersonal ones caused, in the present instance, judgments and feelings which were too unsympathetic. In later years I have never ceased to regret the error thus committed.

There remains little more to be said concerning my last days on the Birmingham and Gloucester Railway. Part of February was spent at Worcester. A letter of the 24th says.

"I have been absent from Bromsgrove ever since Monday the 14th, helping with the completion of the Cornish Parliamentary plans. We have been so overworked that I have had no time to attend to private affairs. We were at work on Tuesday last from 8 A.M. to 3 A.M. next morning, and every other day in the week from the same hour to 12 at night, and even Sunday was not exempt from its portion. All the rest worked the whole day, but I would not continue beyond mid-day. I found my eyes beginning to be affected, and I was determined not to injure them on any account. However, it is now all over, and I am not much the worse for it."

I was led to take this peremptory course by experience gained when under Mr. Fox on the L. & B. Railway. Exhausting physical exertion, continued there for several days, had produced a very marked effect on my eyes. For the first time in my life they began to ache when used for some hours in drawing; and a considerable time elapsed before they recovered their tone. The warning had not been thrown away, as is shown by the paragraph succeeding the one above quoted:—

"If the chief were to make any remark on my absenting myself on Sunday when others remained, I should tell him plainly that I considered he had no right to work his officers so hardly, and that he had the injury of their constitutions to answer for."

That the course taken was not unjustified is shown by the fact that my friend Jackson suffered severely from having yielded to the pressure put upon him. A letter written to me from London six weeks later, and which begins with the sentence:—"If ever a man began to feel ruin it is I," describes how his eyes had failed so completely that not only was work interdicted but he was forbidden to

look at a book; and it was long after the date of this letter before he recovered: one curative measure being a tour in Scotland. This fact should be a warning to those who think they may trespass upon their powers, and disobey their sensations, with impunity.

Miscellaneous occupations of various kinds, which it is needless to specify, occupied March and the greater part of April; and then, on the 26th April, having squared all details and visited Powick to say good-bye to my friends, I took my departure for Derby; where, with the aid of the considerable sum I had laid by, I hoped to carry out my plans.

PART IV

CHAPTER XIII.

RETURN TO DERBY.

1841—42. ÆT. 21—2.

APRIL 26, 1841, served for the journey; so that, next day being the 27th, my 21st birthday was kept at home. No recollection of it remains save that, during an evening walk in the Arboretum, my old schoolmaster expressed his satisfaction that I had not come back to the paternal roof injured by dissipation, as many young men do. Three years and a half had elapsed since my departure; and they had been on the whole satisfactory years, in so far as personal improvement and professional success were concerned.

The mention of improvement recalls the fact that one motive for not accepting the permanent post on the Birmingham and Gloucester Railway offered to me, was the desire to prepare for the future by a course of mathematical study. A work on the Differential Calculus was pored over for a short time, but the reading of it soon ceased. All through life my constitutional idleness has taken the form of inability to persevere in labour which has not an object at once large and distinct. To apply day after day merely with the general idea of acquiring information, or of increasing ability, was not in me. But with an important and definite end to achieve, I could work. In this case the end was neither sufficiently important nor sufficiently definite, and my energies quickly failed.

The chief motive for disengaging myself, however, was that already intimated—the desire to carry out, in a way already devised, my father's idea of an electro-magnetic engine. This desire was soon traversed in a totally unforeseen manner. *The Philosophical Magazine* was one of the periodicals taken in and circulated by the Derby Philosophical Society, to which my father belonged. It was, I believe, in one of the numbers of this, though I cannot now identify it, that I read an article on the question of motors. The result of reading this article was an immediate abandonment of the scheme. It proved to me that an electro-magnetic engine worked, as all such engines in those days were supposed necessarily to be, by a galvanic battery, could never compete in economy with a steam-engine: the general argument being that the process was one of utilizing the force latent in coal, and that there must be a greater waste in doing this by the agency of smelted metal oxidized in a battery, than by the agency of coal burnt under a boiler. It did not occur to me that an electro-magnetic engine, though much less economical, might have advantages over the steam-engine for special purposes. Nor did anybody at that time dream of generating electricity by the force of falling water. But it was quite as well that I gave up the project; for, apart from the reason for doing so which prompted me, there would soon have been disclosed a still more cogent reason. The plan devised would have encountered insurmountable difficulties.

Thus, within a month of my return to Derby, it became manifest that, in pursuit of a Will-o'-the-wisp, I had left behind a place of vantage from which there might probably have been ascents to higher places. It then appeared that an unqualified blunder had been committed. But things do not always work out in conformity with expectations. A false step may eventually lead to a path more advantageous than the one deserted. Had there not been this

seemingly-foolish act, I should have passed a humdrum, and not very prosperous, life as a civil engineer. That which has since been done would never have been done.

Not many days after my return home, there was brought for our inspection a beautiful herbarium, made by a young medical man in Derby during his student days. Why so much effect should have been produced is not obvious; but my ambition was at once fired to make a herbarium as good or better. The first step was to provide a needful appliance. My father had led me, when a boy, to acquire some manual dexterity, and this was now utilized. Paying a carpenter for the use of his bench and tools, I devoted a few days to making a botanical press—not indeed the whole of it: four large wood-screws were ordered from a turner. Of course, as it may be supposed, this press was unlike anything existing, but it answered its purpose well.

Afternoon walks subsequently were made interesting by the search for specimens; and in the course of some months there resulted a considerable collection of the more conspicuous ordinary plants which the fields and hedgerows round Derby furnished. It still exists, and shows that the ambition which prompted me was not unfulfilled.

The interest thus shown in botany was not, in any considerable measure, scientific. The instinct of acquisition and the desire to produce something worthy of admiration, united to stimulate me; and the little knowledge gained was incidental only. Though I knew by name the system of Jussieu, the Linnæan system served my purpose, and the Natural Orders remained unknown. But such acquaintance with vegetal structures as was then acquired, was doubtless of use in after years when biology became a subject of methodical study.

The reaches of the Derwent above Derby were in those days rural, and in parts not unpicturesque. The railway

bridge which now spans the river just above the town, did not exist; and suburban quiet was not broken by the shrieks of whistles. A pleasure-boat excursion up to the mills at Darley (not then made inaccessible by the stretching of an iron bar from bank to bank) was enjoyable.

On fine mornings during the latter part of May and a good part of June, any one who, between 7 and 8, was near this stretch of water, would very likely have heard some familiar melodies: now one voice only being audible, and now another voice joining in with a second. These voices were those of myself and a friend. Finding, while at Worcester, that rowing was beneficial, I had, soon after my return home, hired a boat for a quarter of a year, and had invited this friend to join in morning excursions. As before said, there was much singing in our office at Worcester, mostly of sentimental ballads; and of these my memory had accumulated a considerable stock: an uncultured taste being satisfied with songs of a kind which in later life I have come to detest. My friend, some two years my junior, was also passing through that phase in which there is contentment with manufactured music, as distinguished from the music of inspiration. Thus led by our likings, we not unfrequently made the woods near Darley echo with our voices: our secular matins being now and then arrested for the purpose of gathering a plant. There is still, in the herbarium above named, a specimen of Enchanter's Nightshade gathered in the grove skirting the river near Darley.

My companion, known by sight from early boyhood, had only now, during the few preceding weeks, become personally known. His name, Edward Lott, will recur frequently throughout this autobiography; for the friendship thus commenced was a lifelong friendship. His nature was one which it is difficult to praise unduly. Not that he was intellectually remarkable in any way, but that he was morally of the highest type—absolutely conscientious,

and, along with the sentiment of justice, displaying in large measure all the other altruistic sentiments. During the many years of our great intimacy, in the course of which we were frequently travelling companions, I never saw him out of temper. His face, which was extremely handsome, indicated his character. The expression united dignity, mildness, and serenity. He impressed every one with his innate goodness. When, nearly 40 years afterwards, he accompanied me on a visit to the house of friends in Gloucestershire, joining an Easter party to all members of which he was a stranger, an inquiry of the hostess what they thought of him, brought the reply—"Oh, we are all in love with Mr. Lott."

In 1841, and for many years afterwards, he was an adherent of the current creed—a member of the Established Church. Now and then differences of opinion arose between us: always amicable differences, however. But during the latter part of his life these disagreements on religious questions, as well as on political questions, died away.

The contrast is remarkable between the present time, in which children often see a good deal of the world before they get into their teens, and the time when I was young, when but few people went far from their native places. I make this remark *à propos* of the fact that until after I was one-and-twenty I had never seen the sea.

My father always spent his summer vacation at the sea-side; not commonly remaining stationary, but rambling along the coast day by day from one place to another. One of these vacation rambles was due soon after my return home, and I agreed to join him. The Isle of Wight was our proposed region. After a day or two at Southampton, seeing among other places Netley Abbey, we passed over to Cowes, and in the course of a week walked thence by way of Ryde, Brading, Sandown, Ventnor,

Blackgang Chine, Brixton, and Freshwater, round to Yarmouth. It was a delightful time, leaving vivid recollections. The emotion which the sea produced in me was, I think, a mixture of joy and awe—the awe resulting from the manifestation of size and power, and the joy, I suppose, from the sense of freedom given by limitless expanse. In those days the Isle of Wight was more rural than now; and, joined with the pleasurable feelings given by the sea itself, there were those which the scenery and the shore gave. My father and I were in sympathy on most matters, and our rambles along the coast brought us objects of interest almost from step to step—now the geology of the cliffs and the new plants growing about them, now the physical effects produced by the waves, now the living things on the beach, vegetal and animal. That there was some collecting going on is proved by a letter of my father's written home, which says of me:—"He is about to send off another packet [of curiosities] to-day." One small incident was that at Luccombe Chine we passed just as some boatmen were landing a sun-fish. Knowing Prof. Owen, my father wrote to him telling of the fact, and intimating that the creature might perhaps be useful for dissection.

From Yarmouth we passed over to Portsmouth, whence, after a few days, came a migration to Hayling Island. At the end of a quiet week there we parted—he to complete his summer tour, and I to return home; for the fund I had devoted to the trip was exhausted.

My mornings during this period were usually devoted to some kind of work, if an occupation usually of a more or less speculative kind may be so called. Of work in the ordinary sense—activity directly conducive to advancement—there was little or none: probably because there was no opportunity for it. In July one of the things which occupied me was an investigation concerning the

strength of girders. There resulted a paper on the subject published in *The Civil Engineer and Architect's Journal* for September, 1841. The outcome of it was a very elaborate algebraic formula, which will raise a smile on the face of any one familiar with the higher mathematics; for what it achieves in a laborious way is doubtless achievable by the Infinitesimal Calculus in an easy way. It is neither worth preserving, scientifically considered, nor has it any interest for the general reader. Should any one exhume it he must be prepared for strange blunders. No proof was sent; the result being that the compositor and reader transformed the equation in ways peculiar to themselves.

Attention had recently been drawn to the process of depositing metal by electrolysis—a process discovered by Prof. Daniel, which has since undergone such extensive developments. The subject interested me and I commenced experimenting; meeting, if not with much success, yet with sufficient success to prompt speculations concerning possible uses of the method. It occurred to me that by covering a surface with something like an etching ground, then cutting through this by an etching tool, and then depositing by electrotype a sheet of copper over the whole surface, there would be produced a block with lines in relief like those of a woodcut; and it seemed that this way of producing a printing block would be far less laborious than that which the wood-cutter adopts. I carried the idea into practice, and, though not with satisfactory results, yet with results which promised well. Having done this, I went to consult the list of patents. But already the plan, too obvious to be overlooked, had been taken possession of. The list of patents, or else of caveats, contained a sufficiently clear description of it.

This disappointment proved to be a disguised good fortune. The process, presently brought to bear, went under the name "glyphography"; and was adopted to a certain small extent. It had drawbacks, however, and

failed to compete with other methods; until, in a few years it was no more heard of.

Experiments in electrotyping aroused some interest in electro-chemistry. I made myself a small galvanic battery and tried to deposit other metals than copper; not, however, with much success. There came, too, attempts to form crystals by electrolysis, accompanied by wild hopes respecting the pecuniary results to be obtained. Joined with these electro-chemical inquiries there were others exclusively chemical, of which traces exist among surviving memoranda. Naturally, too, my speculative tendency came into play, and some papers preserved concern the interpretations of "quantity" and "intensity" in electricity.

But all these experiments and speculations ended in no practical results. The only benefits were certain small additions to knowledge, and some little increase of manipulative skill.

To the experiments and speculations which occupied the mornings, and the country walks in search of plants, which occupied the afternoons, there was now added, in the latter part of the day, another occupation. In 1841 a movement was commenced for the diffusion of vocal music. Wilhelm's system was introduced into England; and Mr. Hullah, under some official authority, established a teaching organization in the chief towns. Though given to the singing of songs, I had no knowledge of music from notes. The desirableness of acquiring such knowledge was manifest; and the opportunity was seized.

The cultivation of part-singing was the chief aim. Beyond the set lessons there were soon commenced practices at the house of my friend Lott: he and his sister and I passing at least one evening a week in trying over glees and madrigals. After the course of instruction was over, a small Glee-Society was formed of some dozen members, of whom I was one. Not only during this period, but for

years after, part-singing was one of my chief gratifications.

How is it that among those who profess a love of music, this gratification, great at the same time that it is costless, is so little appreciated? There are few enjoyments higher and none so easy to have, where a will to have it is entertained by the requisite number. Perhaps one obstacle is that glee-singing does not display the musical proficiency of young ladies. For this, solo-singing is required. And since our social arrangements are, in chief measure, adjusted to the furthering of marriages, it results that glee-singing is not patronized by mammas or their daughters: all professions of love of music notwithstanding.

Already, before leaving Worcester, there had been established a correspondence with two of my friends made there; and this continued. Letters to Jackson, and letters from him, concerned chiefly professional questions, the steps taken in pursuance of our respective careers, accounts of our common friends or acquaintances, joined, on his side, with a good deal of quizzing. But the correspondence with E. A. B—— was, in considerable measure, devoted to political and religious discussions. Some passages seem worth quoting as indicating the stage of thought at that time reached. A letter written by him on Sept. 4, shows that, while at Powick, I had got beyond the crude belief that a republican form of government is good irrespective of conditions. E. A. B—— wrote:—

"I am perfectly aware that you hold the opinion that governments that are fitted for one time and people are by no means fitted for another; but you used to dwell upon it more particularly with regard to religious government, and there I differ from you entirely."

And then in the same letter there occurs the paragraph:—

"I do not admire your definition of government at all, though I cannot at this moment suggest a better. You call it 'a national institution for preventing one man from infringing upon the rights of another.'"

Thus it appears that at twenty I entertained, though in a crude, unqualified form, a belief which much of my energy in subsequent years was spent in justifying and elaborating.

Probably there were other passages written at that time showing the drift of thought. But when, some thirty odd years afterwards, I asked E. A. B—— if he could let me have my letters to him, he replied that they had been burnt at the time of his marriage, when he destroyed all useless papers.

The practice of making pencil portraits, commenced at Powick, was continued after my return home, when sundry relatives and friends sat to me. One of the first results was the sketch of my grandmother, given in the first Part—"Family Antecedents." There was soon executed, too, a portrait of Lott, promptly laid hands on by his sister; and there were others of two of my father's particular friends.

In so far as literal representation went, these were not amiss; but they were all bad considered artistically. Some men there are who at once perceive those traits which give the distinctive character to a face or other object. My father had a considerable amount of the faculty thus shown; but I inherited none of it. A tolerably exact perception, joined with a fair amount of manual dexterity, enabled me to render with some truth each particular line and shade which I saw, but did not enable me to seize, in the midst of the complex impression, the proportional importance of its components. It is the ability to do this which constitutes the power of representation when it rises to what we call genius.

With this making of pencil portraits there was presently joined the copying of life-sized heads taken from the antique, and afterwards the drawing of ideal heads. Some of these survive. They possess very little merit.

There is in them no vigour of imagination—no individuality of expression; nothing beyond meaningless good looks.

Soon after, if not at the same time, came drawing of other kinds—landscape sketches, not from nature but from fancy, and practices in the drawing of foliage. These displayed just the same lack of that artistic power which is born, not made.

The drawing of heads presently gave rise not only to these other kinds of drawing, but also to modeling. The initiation of this I do not remember. Perhaps it was inspection of some faces which my father had modeled when a young man—especially a laughing face. The history of this was that one of his pupils (Archibald Fox, a brother of the late Sir Charles Fox) was taking lessons in modeling, and that the criticisms my father passed on his work led to a challenge to model something himself. This laughing face was his response, and a very successful response it must have been. It is remarkable for a first attempt. But, as I have said, my father's quick æsthetic perception was not transmitted to me, and the results of my efforts in modeling had no merit beyond that of mechanical imitation.

In the office at Worcester there had been made not only drawings for engineering works, but also those for various buildings—stations, offices, engine-houses, and so forth. Naturally there occurred occasions for the discussion of architectural principles; and of course my views were ordinarily heretical—expressions of dissent from that subordination to authority which was usually displayed and defended.

During the autumn of 1841, I devoted a little attention to architecture; reading up the descriptions of the Greek orders and other styles, and making sketches. There was commenced, too, a very ambitious design—a vast temple

of rather complex character and unusual distribution of parts. The chief aim was to produce a drawing which should be a *tour de force* in perspective. Enough of it remains to show the general idea; but, as usually happened with me when there was no large ulterior purpose, my resolution flagged, and the project was not carried far.

There was also a sequence more relevant to these discussions at Worcester. In December I wrote a letter on "Architectural Precedent," which was published in *The Civil Engineer and Architect's Journal* for January 1842; and then, in reply to some comments, mainly sympathetic but partly adverse, which appeared in the February number of that periodical, there appeared in March a second letter from me. These letters are not worth preserving.

From the account of my boyhood there was omitted an incident which now had its effect. Between 1820 and 1830, phrenology had been drawing attention; and there came over to England, about 1830 or after, Gall's disciple, Spurzheim, who went about the country diffusing knowledge of the system. Derby was among the towns he visited. Being then perhaps 11, or perhaps 12, I attended his lectures: having, however, to overcome a considerable repugnance to contemplating the row of grinning skulls he had in front of him. Of course at that age faith was stronger than scepticism. Accepting uncritically the statements made, I became a believer, and for many years remained one.

Not unnaturally, therefore, it happened that when, at the close of January, 1842, there came to Derby, to give lectures and examine heads, a phrenologist at that time of repute—Mr. J. Q. Rumball—I presented myself to him for characterization. Here are the results; given not because of their intrinsic value, but because they furnished a text for the opinions about me expressed by my two most intimate friends:—

Alimentativeness	Moderate.	Identity	Moderate.
Gustativeness	Do.	Weight	Large.
Acquisitiveness	Do.	Colour	Do.
Secretiveness	Do.	Tune (Melody)	Rather full.
Destructiveness	Do.	„ (Harmony)	Moderate.
Combativeness	Rather full.	Form	Large.
Fear	Moderate.	Size	Do.
Firmness	Very large.	Order	Do.
Amativeness	Moderate,	Number	Rather full.
Philoprogenitiveness	Do.	Individuality	Moderate.
Inhabitativeness	Large.	Time	Large.
Adhesiveness	Do.	Locality	Do.
Love of approbation	Do.	Imitation	Moderate.
Self-esteem	Very large.	Constructiveness	Large.
Benevolence	Large.	Concentrativeness	Do.
Marvellousness	Do.	Causality	Rather full.
Hope	Moderate.	Comparison	Do.
? Retrospect	Do.	Wit	Moderate.
Conscientiousness	Very large.	Eventuality	Large.
Veneration	Large.	Language	Rather full.

"Such a head as this ought to be in the Church. The self-esteem is very large; it will only produce self-respect, a fear of degradation, therefore, united as it is here to a very full moral development, itself is a moral faculty, and it is almost impossible that you should be other than a high-principled man. Something obstinate, but even this will unite itself with the higher powers not the animal propensities, and I know not that a man's principles can be too obstinately adhered to. Persevering and prudent, reasonably prizing money and benevolent withal. It is clear that I find no fault so far.

"If the forehead were as quick as it is sound, if the memory of details were equal to the general memory, there would be no fault here neither, but individuality is not full enough; this is the only fault I see. General talent therefore rather than particular genius results from such an organisation. I should not call you *ex necessitate* either a poet a painter or a musician, but you may acquire considerable proficiency in either, especially in music. Verbal memory is rather good than otherwise, and mathematics will be no difficulty, and yet I do not discover any one particular talent. The temper is somewhat reserved and perseverance the principal characteristic of the mind.

"J. Q. RUMBALL.

"Herbert Spencer, Esq., Jan. 29, 1842."

Thinking that it would be interesting to hear what

Jackson thought of it, I sent this characterization to him. Here is his comment:—

"I must confess [I] thought it an odd one and not altogether worthy of Monsieur Rumball. I do not think it is a correct one; for instance he says that you have taste for music drawing &c. &c. equally and that he does not find any one more prominent than the other, from which he deduces the opinion that you might be clever in all but not to shine in any. Now I do not for a minute wish to detract from your merits, as I do, and always shall, consider them of a high order; but nevertheless I think that you might study drawing and painting and sculpturing &c. with the greatest zeal without attaining to eminence, whilst the study of philosophy, natural history, chemistry and sciences generally, if pursued would be easily within your grasp even to the furthest extent. Pardon me if I even hint that I do not think music an ingredient of your spirit, if I may so term it. As to your being brought up for the Church, I don't think you are half so fit for it as I am; not on account of qualities or abilities, as in that respect you far outstrip me, but because you are of a much more restless mind more likely to be moved by every new doctrine and apt to be led away by an ingeniously devised plan, and knowing your views about Church government, I may certainly add that Mr. Rumball never will see you in a gown, &c."

Jackson, at my request, forwarded the phrenological measurements and inferences to E. A. B——, whose remarks were as follows:—

"To come to another subject which has afforded me considerable amusement and some satisfaction inasmuch as it goes a long way to confirm my previous opinion—I mean your phrenological development as laid down by Rumball. Now I will not pretend to say that there is [not] a good deal of truth in what he has said with regard to your *general* character; but I do mean to say that he might have arrived at the same conclusion without feeling your head at all. For instance, without any compliments, a person need not look at you twice to ascertain that you are no fool and this after all is the upshot of all he says, the only amplification of this being his opinion that your talent is more general than individual. Now to ascertain the latter he need only have talked to you for a quarter of an hour upon any subject [which he did not] inasmuch as the readiness you show to engage in argument upon *all* subjects is almost presumptive evidence that you have not devoted your energies to any *one* or *two* subjects, and the deduction is pretty obvious. In the details of your character he is on the whole very correct, the only point upon which he is definite in which he is right and in which there is I should imagine

some difficulty in judging, is in his opinion of your musical talent which he describes as large and only qualified by the generalness (if one may coin a word) rather than individuality of your turn of mind. N.B. Did you whistle 'The Admiral' while he was organizing? In one instance in which I should think it difficult to judge he has, as I think you must see yourself, signally mistaken you. He speaks of your 'veneration and respect for *superiors* as *large*.' That is the last thing I should have thought of accusing you of, and I believe I understand and can appreciate your character very well. I think that my definition of your mind as a *radical* one, is as good a one as can be given. You are radical all over in anything and everything—in religion, in politics, in engineering, manners, &c., &c."

Papers yield evidence that at that time my faith in phrenology was unshaken. There are memoranda on the emotions of self-esteem and love of approbation, to the disadvantage of the last and advantage of the first; and there are also some characteristic memoranda concerning "the evils of great veneration." Curiously illustrating the speculative tendency, shown in this as in other directions, there is, among these memoranda, a design for an ideal head—I do not mean face only, but contour of skull.

April, 1842, brought a temporary return to engineering activities. A tributary of the river Derwent which runs through Derby, called the Markeaton Brook, was raised suddenly to an immense height by a local deluge of rain, and overflowed to the extent of producing in the main street a flood of some six feet in depth: the level attained being so unusual that it was marked by an iron plate let into the wall. It occurred to me to write a report on this flood; and to make suggestions for the prevention of any like catastrophe hereafter. This report was presented to the Town Council, and afterwards printed and distributed by their order.

But the plan I recommended for preventing in future any such disastrous overflows, was one implying expensive engineering works, and was not adopted.

CHAPTER XIV.

A VISIT AND ITS CONSEQUENCES.

1842. ÆT. 22.

AFTER the middle of May, my uncle Thomas came to see us, and it was agreed that I should go back with him to Hinton. Six years had elapsed since I left it as a youth of 16, and there was an anticipated pleasure in returning to old scenes, and seeing again well-known faces.

Railway-communication was then but imperfect, and from Cheltenham to Cirencester we journeyed by coach. The journey left its mark because, in the course of it, I found that practice in modeling had increased my perception of beauty in form. A good-looking girl, who was one of our fellow-passengers for a short interval, had remarkably fine eyes; and I had much quiet satisfaction in observing their forms. Beyond the ordinary pleasure that would have been given by recognition of the eyes as fine, there was a more special pleasure in contemplating the elegant curves of the eyelids. I set down this recollection mainly because it opens the way to some remarks on æsthetic culture as a part of education. The practice of drawing or modeling is to be encouraged not merely with a view to the worth of the things produced, for, in the great majority of cases, these will be worthless; but it is to be encouraged as increasing the appreciation of both Nature and Art. There results from it a revelation of natural beauties of form and colour which to undisciplined perceptions remain invisible; and there results, also, a

greatly exalted enjoyment of painting and sculpture. The pleasure which truthful rendering gives is increased by increasing the knowledge of the traits to be rendered.

My first letter home, dated 23rd May, contains a passage which is not without significance.

"My aunt did not know me at all for some moments when I made my entrance alone, which we had arranged I should do. No one recognized me, and of course all agree that I am much altered. I go to Bath this afternoon to surprise my old friends there."

A letter of the same date, written by my aunt to Derby, implies the nature of the change:—

"I am so delighted to have Herbert with us, who is so agreeable and amiable a companion that his uncle and I shall indeed be very sorry to lose him. I think I never witnessed so great an improvement in any young person."

A kindred change which had been similarly commented upon when I was at Worcester, where my aunt had seen me in 1839, I ascribed to escape from those restraints of earlier life which were more at variance with my nature than with most natures; and it would seem that this still greater change had been due to continuance of the same cause; for between my days at Worcester and this visit to Hinton, there had been three years of independence. Possibly, there was a further cause—slowness of development. This had been decidedly shown physically, in so far as stature and structure were concerned; and it may have been shown mentally: not, perhaps, in respect of the intellectual faculties but in respect of the emotional faculties. The higher of these were longer than usual in gaining their full strength.

Shortly after my arrival, there came a sequence to the practice of modeling, recently named. My uncle had seen the results of my attempts, and it was agreed that I should model a bust of him. Whether the suggestion came from him or from me does not appear, but letters

show that some steps had been taken before the beginning of June. Progress was not rapid, and it was made the slower by the inaptitude of my uncle for sitting. He had but small æsthetic perception, and no dramatic faculty whatever; the result being that his notions of a fit pose and fit expression were often such as to give me some amusement while they put difficulties in my way. A letter to my mother, of June 29, says:—

"I am going on very successfully with the bust: much better in fact than either my father or myself had expected. [My father had come to Hinton on his way to the sea-side.] It will probably be as much as a fortnight before it is finished; and as soon as it is so I shall return home. I have been working rather too hard to be able to enjoy my visit much. What with the modeling and writing letters to *The Nonconformist*, I have sometimes hardly stirred out for two or three days together."

A letter from my aunt, written on the 10th July, after my return to Derby, quotes laudatory opinions expressed by friends about the bust—good natured praise, mostly, I dare say. But, true as the likeness may have been in the eyes of those who looked only for literal reproduction, it was, in common with other products of mine which I have commented upon, without any display of artistic faculty. This the reader may perceive from the reproduction of it given in the preliminary part. Especially inartistic was the hair. For the representation of this something more than literal reproduction of lines and surfaces was needed; and in this something more I failed. The details of the hair were both unnatural and awkward.

It used, however, to be some consolation to me to observe that the ancient sculptors did not commonly succeed in rendering hair. Of course I do not mean to say that their representations were awkward; but only that they failed in naturalness. I shall doubtless produce in most readers astonishment by this allegation. So profound is the general subjection to the established belief in Greek superiority, that adverse criticism upon anything

Greek seems something like blasphemy. But I no more pin my faith on the opinions of a classically-educated man about things Greek, than I pin my faith on the opinions of a clergyman about things Hebrew. In their treatment of hair, the Greeks did not duly regard the fact that the substance in which they were working is so remote in physical characters from the substance to be represented, that any attempt at literal imitation must fail; and that the rendering must be by suggestion rather than by reproduction. In shaping the marble it was their habit to cut out the interstices among the locks to depths such as exist among the locks of actual hair, and to give to the projecting portions in their representations as much prominence as they had in fact. But since actual locks consist of hairs between which light passes to a large extent, and since the solid substance in which they are reproduced is one through which the light does not thus pass, it results that, if the locks are literally imitated in their shapes, the lights and shades in the marble are far more pronounced than they are in nature. Nor is this all. Hair is generally of a more or less dark shade, and the difference in depth of colour between its lighted parts and its shaded parts, is consequently made far less than that which exists between the two in a substance like marble. Hence a further cause of error, co-operating with the other. Necessarily, therefore, to get anything like a true effect, the elevations and depressions in the marble must be far less than they are in fact.

Apparently from recognition of this truth, many modern sculptors have succeeded in representing hair much better than the ancient sculptors did.

In one of the extracts above given, reference is made to certain letters I was writing to *The Nonconformist* newspaper—a newspaper which had recently been established as an organ of the advanced Dissenters, and which was

edited by Mr. Edward Miall, afterwards for some years member of Parliament for Rochdale.

The proximate origin of these letters cannot now be recalled. Probably conversations with my uncle led to them. He had much interest in politics, as had all members of the family: not, however, the interest commonly shown—interest in ministries and men, but interest in principles and measures. The mental attitude of the Spencers was unlike that now displayed by those who call themselves Liberals—an attitude of subordination to the decisions of Mr. Gladstone—an attitude of submission to personal rule similar to that shown in France when, by a *plébiscite*, the people surrendered their power into the hands of Louis Napoleon. The nature shown by all members of our family was quite opposite to this.

The implied kinship of feeling and thought led to a general congruity in the political views held, and led, especially, to a common tendency towards Individualism. With the absence of that party "loyalty" which consists in surrendering private judgment to men who are in office, or else to men who want to be in office, there naturally went a tendency to carry individual freedom as far as possible; and, by implication, to restrict governmental action. Daily talks with my uncle doubtless disclosed various agreements arising from this community of nature; and hence arose the suggestion to contribute, to *The Nonconformist* newspaper, a series of letters setting forth the opinions I had been uttering. My uncle knew Mr. Miall, and with the first letter sent an introduction.

The twelve letters thus commenced and afterwards serially published, contain some ideas which it may be interesting to quote, because of their relations to the system of beliefs elaborated in subsequent years. Besides views afterwards set forth in a more formal manner, there are indications of drifts of thought which in course of time became pronounced and definite. Here are some sentences from the first letter:—

"Everything in Nature has its laws. Inorganic matter has its dynamical properties, its chemical affinities; organic matter, more complex, more easily destroyed, has also its governing principles. As with matter in its integral form, so with matter in its aggregate; animate beings have their laws as well as the materials from which they are derived. Man as an animate being has functions to perform and has organs for performing those functions. . . .

"As with Man physically, so with Man spiritually. Mind has its laws as well as matter. . . .

"As with Man individually, so with Man socially. Society as certainly has its governing principles as Man has. They may not be so easily traced or so readily defined. Their action may be more complicated, and it may be more difficult to obey them; but nevertheless analogy shows us that they must exist."

Then comes the corollary that those people are absurd who suppose that "everything will go wrong unless they are continually interfering . . . they ought to know that the laws of society are of such a character that natural evils will rectify themselves" by virtue of a "self-adjusting principle." There follows the inference that it is needful only to maintain order — that the function of government is "simply to defend the natural rights of Men—to protect person and property—to prevent the aggressions of the powerful upon the weak—in a word, to administer justice."

The letters which followed were devoted successively to treating of Commercial Restrictions, A National Church, The Poor-Laws, War, Government-Colonization, National Education, and Sanitary Administration: the purpose of each letter being to show that, while the various State-activities implied are excluded by the definition of State-duties, there are various reasons for otherwise concluding that they are injurious.

The position taken up in the letter concerning War is utterly untenable. I might indeed, had I been then aware of the facts, have cited in support of my argument the case of the Iroquois League, under the arrangements of which wars were not carried on by the government,

but by chiefs who gathered together voluntary followers; or I might have named the early German tribes as having pursued a kindred system. But it is clear that these were exceptional systems, not permanently practicable. I failed to recognize the truth that, if the essential function of a government be that of maintaining the conditions under which individuals may carry on the business of life in security, this function includes, not protection against internal enemies only, but protection against external enemies. But the youthful enthusiasm of two-and-twenty naturally carried me too far.

In addition to the quotations above given as being significant, let me here add two others which are no less significant.

"Every animate creature stands in a specific relation to the external world in which it lives. From the meanest zoophyte, up to the most highly organized of the vertebrata, one and all have certain fixed principles of existence. Each has its varied bodily wants to be satisfied—food to be provided for its proper nourishment—a habitation to be constructed for shelter from the cold, or for defence against enemies—now arrangements to be made for bringing up a brood of young, nests to be built, little ones to be fed and fostered—then a store of provisions to be laid in against winter, and so on, with a variety of other natural desires to be gratified. For the performance of all these operations, every creature has its appropriate organs and instincts—external apparatus and internal faculties; and the health and happiness of each being are bound up with the perfection and activity of these powers. They, in their turn, are dependent upon the position in which the creature is placed. Surround it with circumstances which preclude the necessity for any one of its faculties, and that faculty will become gradually impaired. Nature provides nothing in vain. Instincts and organs are only preserved so long as they are required. Place a tribe of animals in a situation where one of their attributes is unnecessary—take away its natural exercise—diminish its activity, and you will gradually destroy its power. Successive generations will see the faculty, or instinct, or whatever it may be, become gradually weaker, and an ultimate degeneracy of the race will inevitably ensue. All this is true of Man."

Then in the next letter, in reply to the argument (which the editor I think had urged against me) that "society is

a complicated machine," and that it is the business of government to keep "everything in equilibrium" it was said:—

"If it should be discovered that the great difficulties encountered in the management of social concerns, arise from the disturbance of natural laws, and that governments had been foolishly endeavouring to maintain, in a condition of *unstable* equilibrium, things which, if let alone, would of themselves assume a condition of *stable* equilibrium; then must the objection be to a great extent invalidated."

In these several extracts are indicated both specific ideas and modes of thought which foreshadowed those to come. There is definitely expressed a belief in the universality of law—law in the realm of mind as in that of matter—law throughout the life of society as throughout individual life. So, too, is it with the correlative idea of universal causation: implied in the extracts given, this also pervades the entire argument. Quite pronounced is the assertion that throughout the organic world there goes on a process of adaptation by which faculties are fitted for their functions. This process is said to hold of Man as of other creatures: the inference following the one quoted being that, according as his social relations are of one or other kind, Man will gain or lose character and intelligence. And then there is the definite statement that along with this equilibration between the faculties of individuals and their circumstances, there is a tendency in society towards equilibrium—there is self-adjustment, individual and social. Thus the tendency of thought was even at that time towards a purely naturalistic interpretation, and there was a recognition of certain factors in the process of evolution at large.

We all occasionally moralize on the great effects initiated by small causes. Every day in every life there is a budding out of incidents severally capable of leading to large results; but the immense majority of them end as buds. Only now and then does one grow into a branch;

and very rarely does such a branch outgrow and overshadow all others.

The contributing of these letters to *The Nonconformist*, exemplifies this truth in a way more than usually striking. Had it not been for this visit to Hinton—had it not been for these political conversations with my uncle—possibly had it not been for his letter of introduction to Mr. Miall, the first of these letters would not have seen the light, and the rest of them would never have been written. Had they never been written, *Social Statics*, which originated from them, would not even have been thought of. Had there been no *Social Statics*, those lines of inquiry which led to *The Principles of Psychology* would have remained unexplored. And without that study of life in general initiated by the writing of these works, leading, presently, to the study of the relations between its phenomena and those of the inorganic world, there would have been no *System of Synthetic Philosophy*.

Already I have pointed out that the apparently unfortunate cessation of my engineering life, opened the way to another kind of life. And now the writing of these letters on "The Proper Sphere of Government," commenced at Hinton and finished during the months succeeding my return to Derby, constituted the first step towards this other kind of life.

CHAPTER XV.

BACK AT HOME.

1842—43. ÆT. 22—23.

BEYOND completion of this series of short essays, of which less than half were written at Hinton, there came before me soon after my return another subject of interest. A letter of July 11, 1842, to my father, who was still at the sea-side, closed with the sentence:—"Lott has just called to take me to a lecture on Phonography, so that I have no more time to spare for you."

The attendance on this lecture had sequences immediate and remote. During many preceding years my father had been, at leisure, elaborating a new system of shorthand. When, as a boy of thirteen, I went to Hinton, it had reached such a stage that I was—not much to my satisfaction—required to take down in it notes of my uncle's sermons: very brief notes they were, as may be supposed. During subsequent years successive improvements were made in it, and, by the time I was 21, it had assumed its final form—final, at least, in respect of its essentials; though, prompted by his restless ideality, my father went on changing its minutiæ as long as he lived: not always with advantage I suspect.

The above named lecture on Phonography impressed me with its merits; and, in a subsequent conversation with my father, I intimated the belief that Pitman's system was better than his. Saying that this belief was an erroneous one, he requested me to compare the two in detail. I did

this; and the result was a thorough conviction that my father was right, and that his system was not only better than Pitman's, but better than any other which has been devised—as perfect, indeed, as is possible.

In Phonography when used for reporting, as in older shorthands, the consonants alone are marked, and "Legible Shorthand," as my father called his system, has no great advantage over them in brevity, so long as this imperfect method of representing words is followed. Its only superiority in that case is that it keeps the line, instead of sprawling about the paper in uncontrolled ways: a fault in Phonography, as in the shorthands which preceded it, and a fault which stands in the way of its use for general purposes. Even had it no other advantage than that of regularity and symmetry, the "Legible Shorthand" would be preferable to all others.

But its chief superiority is that while, like Phonography, it may be written either with or without the vowels, the introduction of the vowels adds comparatively little to the time and effort required in representing a word, while the reading of the word is made easy. In Phonography the vowels, when introduced, are marked by dots and dashes, added after the consonants have been written, and there results an illusive simplicity of appearance: the illusion being due to the fact that the movements of the hand gone through in making these dots and dashes are not shown. When they are shown by dotted lines, it becomes clear that the expenditure of time and effort in marking the vowels, almost doubles the time and effort previously expended in marking the consonants. A comparison between a word written in Phonography to which were added the dotted lines shewing the unseen motions, and the same word written in "Legible Shorthand," proved to me conclusively that, when the vowels are used, the "Legible Shorthand" has a great advantage in brevity, as well as in legibility and elegance.

The study of my father's system, thus commenced, had results some time afterwards.

A rationalized system of letters for writing, raised the thought of a rationalized system of letters for printing—a system which should preserve consistency in each of the several groups—mutes, semi-vocals, liquids, nasals, and vowels. I schemed sets of forms answering to these groups, and having throughout a certain general kinship, as well as a closer kinship within each group, The notion was plausible. It seemed clear that an alphabet so characterized would be desirable. But the conception was a mistaken one. The love of system had over-ridden the thought of use. It did not occur to me that the heterogeneous forms of the letters we now have, is conducive to legibility—renders identification of them much easier than it would be were many of the forms related to one another, as are the small letters b and d, or p and q: the common expression "mind your p's and q's," evidently referring to the difficulty which children find in distinguishing letters that are alike save in the placing of the loop on opposite sides. In the proposed set of letters there were, within each group, kinships of this nature; and there would have been consequent tendencies to confusion. I may, indeed, remark, in passing, that because capital letters have no projections above and below the line, and in this respect present greater homogeneity than do low-case or small letters, lines of capital letters are less easy to read than lines of low-case letters. I was recently struck with this on comparing the product of a type-writer which rendered its matter in capitals only, with the products of those which rendered their matter in capitals and small letters.

Among my papers, associated with those which set forth this scheme, there are others concerning the structure desirable for a universal language. Probably thoughts about the one led to thoughts about the other. A pre-

dominant aim was brevity. The language was to be monosyllabic; and, among the memoranda preserved, there is a calculation showing that there are more than a hundred thousand good monosyllables;—that is if, in addition to simple consonants and vowels, all the compound consonants and compound vowels are used. There are also proposals of methods by which a choice of words for things and acts may be guided—methods which, while paying due regard to logical relationships and classifications, would also pay due regard to euphony.

It seems to me quite possible—probable even—that the time will come when all existing languages will be recognized as so imperfect, that an artificial language to be universally used will be agreed upon. Within these few years we have seen, in the artificial language called "Volapuk," an attempt to fulfil the requirements better than any natural language does. But I should be extremely sorry did there become current any artificial language which sets out with ideas derived uncritically from existing languages, and adopts the system of inflections—a radically bad system. Without intending to assume that they have much value, I think it not amiss to preserve, in Appendix E, the above-named suggestions—not respecting a universal language so much as respecting methods to be followed in forming one.

About this same time also, an allied matter occupied a little attention. During previous years I had often regretted the progress of the decimal system of numeration; the universal adoption of which is by many thought so desirable. That it has sundry conveniences is beyond question; but it has also sundry inconveniences, and the annoyance I felt was due to a consciousness that all the advantages of the decimal system might be obtained along with all the advantages of the duodecimal system, if the basis of our notation were changed—if, instead of having 10 for its basis, it had 12 for its basis: two new

digits being introduced to replace 10 and 11, and 12 times 12 being the hundred. Most people are so little able to emancipate themselves from the conceptions which education has established in them, that they cannot understand that the use of 10 as a basis, is due solely to the fact that we have five fingers on each hand and five toes on each foot. If mankind had had six instead of five, there never would have been any difficulty.

To Appendix E, I have added these memoranda, in which I have set down the advantages of 12 over 10 for purposes of measurement, enumeration, and calculation. Of course to change the system would be difficult; and it would be rendered more difficult still should the use of the decimal notation for weights, measures, and values be established.

In the course of the autumn something beyond schemes and speculations began to occupy my time. I became an active politician.

The days were those of the Chartist agitation. The demand for universal suffrage, triennial parliaments, vote by ballot, payment of members, no property qualification, and equal electoral districts, embodied in a formal document, had become the shibboleth of a Radical working-men's party. The Reform Bill had given predominant power to the £10 householders; and now the class below insisted that they, too, should share in making the laws Their movement, carried on here and there in an intemperate manner, had led to a few riots, to a threatened vast demonstration which was stopped, and to some trials and imprisonments. Mr. Edward Miall, swayed by a pronounced sense of justice, sympathized with the men who put forward these claims; and his sympathy prompted him to write a series of articles in *The Nonconformist*, advocating an extension of the suffrage much like that which the Chartists wished to obtain, and, I think, advocating, with qualifications, some of the associated changes they

urged. These articles were subsequently republished as a pamphlet, under the title "A Reconciliation of the Middle and Working Classes"—a pamphlet which had a wide circulation, especially throughout the dissenting world, of which *The Nonconformist* was the advanced organ. The result was the commencement of "The Complete Suffrage Movement." Mr. Joseph Sturge, the well-known philanthropic Quaker of Birmingham, who had been active in the anti-slavery agitation, became a warm adherent; and, among other places, visited Derby to give an address in aid of Mr. Miall's project: breakfasting at our house on the occasion. Presently a branch was established at Derby, of which I became honorary secretary; and, in *The Nonconformist* newspaper about that period, there exist sundry brief reports sent by me of local doings.

One of these doings produced some sensation in the town, and drew a certain amount of general attention. Of the Chartists who had, during the preceding agitation, got into trouble and been imprisoned, one was Mr. Henry Vincent—a man who, like two others among the early Chartists, Lovett and Collins, was much to be admired. He was evidently prompted by conscientious feeling to devote himself to the advancement of popular welfare, in doing which he displayed great oratorical power. Recognizing the sincerity of those who were following the lead of Mr. Miall, and probably thinking that it would be well to get rid of the odium which the Chartist demonstrations had produced, he joined the Complete Suffrage Movement, and went to leading towns lecturing in advocacy of it. At the beginning of September, 1842, he came to Derby. The announcement of his lecture raised alarm in the minds of the magistrates—predominantly Conservative; and the police were ordered to prevent the delivery of it. At a small gathering forthwith held of those who had been instrumental in bringing Mr. Vincent, it was decided that a protest should be made. I was appointed to write

an address embodying the protest, which I did in the course of the ensuing night—sitting up until some three or four o'clock to do it. Next morning, after being approved, the address was printed, circulated, signed by numerous inhabitants, and in a day or two presented to the magistrates. Some of the Liberal London papers took the matter up. The *Morning Chronicle* and the *Sun*, both now extinct, reproduced the address in their issues of September 6th and 7th respectively; and made editorial comments blaming the magistrates for their uncalled for interference.

In the course of the autumn, interest in the Complete Suffrage Movement so far increased that there was held, at Birmingham, a meeting of leading men from chief towns, to consult respecting the policy to be pursued. Among others present were one or two members of Parliament, and also Mr. John Bright, at that time not in Parliament, and known chiefly as a leading member of the Anti-Corn-Law League. My uncle Thomas, too, took part in the meeting. The decision arrived at was that there should be called a joint conference of the Complete Suffragists and the Chartists, with a view to union and concerted action: the hope being that the Chartists would concede some of their minor demands, and so conciliate their opponents.

This conference was held on the 27th December and following days, and I was sent to it as a delegate from Derby. Deeper knowledge of human nature on the part of those who summoned the conference, might have taught them that the Chartists would listen to no compromise. Fanatics soon acquire passionate attachments to their shibboleths. After a day's debate it became manifest that no co-operation was possible. Even the very name, "the Charter," was insisted upon as one which must be accepted. A division consequently took place, and the Complete Suffragists adjourned to another hall. A proposed Act of

Parliament had been drawn up, embodying the desired constitutional changes. This, it was hoped, the Chartists would join in discussing clause by clause, and in the main agree to. On their refusal, the Complete Suffragists by themselves, in the space of some two days, went through the Bill; now approving, now modifying, its various provisions. The occasion was of course one which, to a young fellow of 22, was exciting; and it produced in me a high tide of mental energy. This is curiously shown by my copy, still preserved, of the draft Bill distributed among the delegates, on which I have written my name. The signature has a sweep and vigour exceeding that of any other signature I ever made, either before or since.

One of the incidents connected with this meeting of the Complete Suffragists at Birmingham, I must name, because of its important sequences. Liverpool had sent as a delegate, Mr. Lawrence Heyworth, afterwards member of Parliament for Derby. He and my uncle Thomas had been friends for several years. Their friendship had originated in their agreement on teetotalism; but they were also in sympathy on leading political questions. My uncle was delegate from Bath, and by him I was introduced to Mr. Lawrence Heyworth. The acquaintanceship then commenced, lasted until his death about 1870; and it opened the way to friendships which, after a time, greatly affected my life.

I may add, concerning this Birmingham conference and the Complete Suffrage movement, that nothing definite eventually resulted. The agitation carried on in furtherance of it, as well as that carried on for the enactment of the Charter, gradually died away; leaving only certain modifications of opinion. Such modifications may perhaps have had something to do with changes since made in our representative system; for these have, to a considerable extent, established in law the proposals which in those days were thought so revolutionary: rightly so thought,

indeed; for the drift towards Socialism, now becoming irresistible, has resulted from giving to the masses not a due proportion of power but the supreme power.

The democratic leanings early shown by me, had long been manifest to the friends with whom I corresponded; and now that they had caused me to take so decided a step as participation in this Birmingham conference, there came from these friends strong expostulations. Certain passages in their letters seem worthy of quotation; both because of what they say and of what they imply. The first is from E. A. B——, who wrote:—

"You are formed for an active part in everything you undertake, and your energetic character would be very likely to lead you farther, than in sober reason and judgment you would go. If you have fully and maturely decided, that the principles you have adopted are right, and are expedient for the well-being of the country, I should be the last to wish you to abandon them to interested motives; but before finally committing yourself to the current, which *may* overwhelm you, I would have you pause. Consider carefully to what all you design, will tend, consider how in taking up such a cause, you lose all *chance* of advancement in the *profession* for which your *talents* and *education* so well fit you; examine carefully the *principles*, *objects* and interests of the men in *whose company* you will certainly *sink* or *swim*, and if after having done so you still remain of the same mind, in God's name *go on*, but again, let me request of you to *pause*, and *consider*. You are now but on the threshold; you have scarcely taken the first step, in a path, the end of which it passes mortal power to foresee, but which may (though may God forbid it) eventually plunge the whole kingdom into anarchy and civil war. It is surely worth considering well, before finally deciding. Whatever may be your fate, or whatever may be mine, I shall always value your friendship very highly, and if at any time I can be of any service to you, I hope you will not hesitate to command me, with as much confidence as if I was of your own opinions. I only hope you may meet many among your own party who will feel as great an interest in you as I do."

To the equally strong protest contained in a letter from Jackson, there is appended a protest, no less strong, against the change of career to which, it seems, I had indicated my leanings:—

"As for the good you've done, it is very questionable whether you've not done ill, for your time has been wasted in strife, your own temper has been ruffled, you've felt and wished ill towards those in power and you've in your pride thought that your mind talents and arm might effect a change. How like man! Think you that you can sway the destinies of mankind? Or perhaps you suppose yourself born to be the instrument in God's hand of working a reformation in this land and of releasing the afflicted from the bondage under which they are suffering. Admitted for argument sake, tho' it is far fetched, but you, my friend, are not following the steps of a Luther a Calvin a Knox a Wikliff, whose names are revered to this hour, holy men who taught and thought as the Holy Spirit directed them—no if an instrument you should be, 'tis not for the reformation of spiritual evil . . . . . but like Cromwell to gain your own ambitious views under the mask of doing your country a service. Doing your country a service! alas! alas!" . . .

"You ask me to which I give the preference— to your remaining in the profession you have commenced or becoming a literary character. To this I decidedly say to the first, in it you are most likely to rise to eminence and thro' it gain a comfortable income, but from the other never. You've never studied properly, you are no classic no poet. Perhaps you might say but I can write reviews and political opinions and by degrees so improve my style, &c., as to be able to appear fairly before the public. To this I can only repeat what I have often said— The public is never to be depended upon. Let one of its favourites once declaim against you and you're done for. Neither do I believe that you can ever receive that emolument which you would seek, unless by very fortunate circumstances over which you can have no control.

"Let me therefore implore you once more to set hand to pencil and start afresh on the old course; apply thro' your interest to Fox. He is now about to carry out the execution of the Dean Forest line of railway, and has the whole contract under Capt. Moorsom; offer your services to superintend, get Capt. Moorsom to recommend and so by fairly starting again cut all the political acquaintances you've picked up who will never do you any good, and your talents and energy will soon raise you to that pre-eminence to which you may aspire.—Did I not feel the same interest in you that I might have towards a brother, don't think I should take the trouble to induce you to do this. Therefore at least give me credit for candour, and reflect before you go on any further."

The first of these passages in Jackson's letter, illustrates the truth that those who live in another sphere of thought and feeling, frequently show themselves incapable of com-

prehending the motives of those opposed to them. Knowing me intimately though he did, my friend could not conceive any other prompter than ambition for the course I took. Lacking, himself, any such political sentiments as mine, he could not imagine me to be moved solely by a desire to help in making what I conceived to be an equitable change. I can say with absolute certainty that the thought of personal advancement of any kind never entered my head. Respecting the second passage, I am led to remark on the amusing way in which people suppose that the writing of good or bad books is to be determined by the presence or absence of classical culture. The quality of the ideas expressed is tacitly ignored—style being everything and matter nothing! To which I may add that there is in this passage, as in the preceding one, the implication that no other desire than that of private advantage could possibly operate. The truth is that throughout my life the writing of books has resulted from the wish to set forth certain ideas, and that during sixteen years' publication of them they brought me not profits but losses.

About my occupations during the early part of 1843, I remember little or nothing. A letter from my father to my uncle contains the sentence:—"Herbert is writing a tract upon 'Pledging Electors.' I think he will make it rather effective." Absolute failure of memory is thus proved; for I should have said that no such thing was ever written by me. From the context I gather that it was intended to be one of a series of tracts issued by the Complete Suffrage Union. I also gather that I was to be one of a committee for selecting and criticizing tracts.

Whether anything was done in the way of engineering, or any other money-making occupation, I do not recollect. Probably there were the usual speculating and experimenting, leading to no practical results.

The latter parts of my days were, during this period, as before and after, miscellaneously filled—country walks in the afternoons, music and sometimes other distractions in the evenings. About this time, or earlier, there had been formed a "Literary and Scientific Society"—a small gathering of some dozen or so, meeting once a month, reading papers and discussing them. The members were mostly of no considerable calibre, and the proceedings were commonly rather humdrum. Further, there existed a Debating Society which I joined, and of course did not remain silent; and there was also, in the leading literary institution of the town, a chess-room, where an hour or so was occasionally spent. I had learnt to play chess at Hinton, and had there become quite a devotee of the game; but nothing beyond mediocrity was reached, either then or afterwards. I once joined with a friend in playing without the men, and succeeded in doing this pretty easily. We had, however, the empty board before us, which greatly aided imagination. Without that aid we should have found the feat impossible.

And now, towards the end of the Spring of 1843, after two years of life apparently futile—certainly futile in respect of "getting on"—it seemed needful to take some decisive step; and, in the hope of finding something to do, either in engineering or in literature, I resolved on going to London.

CHAPTER XVI.

A CAMPAIGN IN LONDON.

1843. ÆT. 23.

My experimental journey to London must have been at the end of the first week in May, for a letter dated May 10 gives a settled address. Letters written soon after imply a resolution, more decided than I supposed then existed, to adopt a literary career. Some passages written to Edward Lott will best show the position and the expectations.

"I am still somewhat in a condition of uncertainty as to what may be my ultimate fate. I have written two review articles, one for the *Eclectic* and the other for *Tait* [magazines both long since deceased]. The one for the *Eclectic* would have appeared in the number for the present month, had it not been that the two previous ones contain papers on the same subject—"Education." The one for *Tait* was [sent] on speculation and still hangs *in statu quo*."

Neither the article written by agreement for the *Eclectic*, nor the article sent on speculation to *Tait*, ever appeared. Possibly the one was—quite rightly, I fancy—thought not worthy of publication; and the other ignored because it was by an unknown writer. It was not without merit; for, ten years after, it was, with improvements, published in the *Westminster Review*, under the title of "The Philosophy of Style." The letter goes on to say:—

"If you get hold of the last week's *Nonconformist*, you will find a leading article written by me, entitled 'Effervescence—Rebecca and her Children.' It will amuse you, I fancy, it being somewhat queer in its ideas. It might be appropriately classified under the head of 'The Chemistry of Politics.'

"At present I am engaged in writing an article for *The Phrenological Journal* upon the new theory of Benevolence and Imitation, which we have talked over together. . . . I hope you are going on agreeably

with your singing exercises. If I could fly over and join you now and then, it would be a great gratification to me, for I am at present leading a rather solitary life, frequently not speaking a score words in the day for nearly a week together."

Fresh indications of my hopes and intentions were given when writing home on July 7. After describing an evening spent with Mr. Miall, the letter goes on to say:—

"He has also laid me under obligation of a more practical kind, of which I was not aware until I saw him on Wednesday. He told me that some friends of his at Colchester, who were about to purchase a local newspaper, had applied to him to become their head editor; meaning that he should supply them with a leading article every week, whilst they employed some one of less capacity to manage the other business for them. He refused this, having, he says, quite enough on his hands at present, and at the same time that he did so, mentioned me as one whom he could recommend to fill the place they wished him to occupy."

Other passages tell me of ambitions which I had utterly forgotten; one of them sufficiently daring.

"I feel more and more determined to write a *poem* in a few years hence, and am gradually working out the plot in my mind and putting down memoranda of thought and sentiment. The title I intend to be 'The Angel of Truth.' Inclosed I send you a few lines by way of specimen of a first attempt. They are supposed to be part of the winding-up of a meditation upon the state of the world during the Dark Ages. . . .

"I have been reading Bentham's works, and mean to attack his principles shortly, if I can get any review to publish what will appear to most of them so presumptuous."

The verse-making disorder, which seems to be escaped by but few of those who have any intellectual vivacity, did not last long. The project named must have been soon abandoned, and a later one, which I recall, was not persevered in. This later one was a drama to be entitled "The Rebel:" the plot of it being not, as the reader may suppose, one exhibiting successful rebellion, but one exhibiting the failure and disappointment of a high-minded hero, consequent on the weakness and baseness of those with whom he acted. But nothing was done beyond thinking over the incidents and characters to be embodied.

Among old papers there are some verses which, I suppose, must have been written about this time. They are not amiss in so far as form is concerned; but there is in them nothing beyond play of fancy. They are manufactured, and not prompted by feeling forcing its way to poetical utterance. I had sense enough to see that my faculties are not of the kind needful for producing genuine poetry. I have by nature neither the requisite intensity of emotion nor the requisite fertility of expression.

In the above section reference is made to an essay setting forth "a new view of the functions of Imitation and Benevolence," which I proposed to send to *The Phrenological Journal*. Of course it was heretical; and, if for no other reason, was, perhaps for that reason, rejected.

There had, however, been established in 1843, a quarterly periodical called *The Zoist*, owned and edited by Dr. Eliotson, a physician of considerable repute in those days. Perhaps I ought to say—a physician who *had been* of considerable repute in those days; for, having become a convert to Mesmerism, and having committed himself to a belief in sundry of the alleged higher manifestations of mesmeric influence, he was a good deal discredited. Nothing daunted, however, he persisted in his faith, and established *The Zoist* mainly, I believe, to diffuse it. But he did not limit his periodical to publication of mesmeric experiments, and controversies concerning alleged mesmeric phenomena; possibly because there was not a sufficiency of this kind of matter to fill all its space. Phreno-mesmerism was at that time the name of one class of the manifestations; and, by implication, Phrenology was recognized as an associated topic. Hence, in part, I suppose, the reason why Dr. Eliotson accepted this essay of mine; which, written in the summer and autumn of 1843, was published in *The Zoist* for January, 1844. I learnt, only several years later, that the theory I had

set forth respecting the nature of Benevolence was not new.

Partially dissentient though I was concerning special phrenological doctrines, I continued an adherent of the general doctrine: not having, at that time, entered on those lines of psychological inquiry which led me eventually to conclude that, though the statements of phrenologists might contain adumbrations of truths, they did not express the truths themselves.

Old letters and documents from time to time surprise me by showing that certain ideas had arisen at much earlier dates than I supposed. An example is furnished by two paragraphs in a letter written to my friend Lott on 14 October '43, embodying some corollaries from the hypothesis set forth in the above-named article.

"I am, however, undergoing an entire revolution in my notions respecting conscientiousness. Like many of the chemical bodies that were at one time believed to be simple elements, it is fated to undergo decomposition. In the first place, I cannot bring myself to believe that the various qualities attributed to it can result from one organ. Justice, love of truth, overseership of the other feelings, and sundry other qualities that proceed from it, appear to me to be too distinct to be the emanations of one faculty. From what primitive powers some of them proceed I cannot at present imagine. I have, however, come to a conclusion respecting the sentiment of Justice. I believe that like Benevolence it is a compound feeling, and further, that *Sympathy* is one of its elements. I was first led to this view by the theoretical considerations which follow almost as a matter of course from the doctrine of Sympathy.

"Thus, if it be admitted that there is a faculty which has for its function the excitement in one being of the feelings exhibited by another, and that the faculty acts in connexion with all the passions of the mind, in such a manner as to produce a *participation* in all the feelings of other beings, it would appear *abstractly* that this power was *sufficient of itself* to produce that respect for *all* the feelings of others which is necessary for social happiness. At any rate it must be admitted that such an arrangement is *capable* of doing this. Now under this supposition it would be unphilosophical to conclude that there was another distinct faculty which, like conscientiousness, had entire reference to other beings. It would involve a multiplicity of

means quite contrary to our notions of the Almighty's arrangements. We must therefore suppose that the sentiment of Justice is a combination of sympathy with some other faculty. What is that faculty? I believe it to be *a sense of personal rights*. That such a power is capable of producing the required impulse is evident—justice might even be termed a sympathy in the personal rights of others, and that it is may almost be proved by an analysis of your feelings. If you will realize the feelings of indignation experienced upon reading the tyrannies and oppressions of man towards man, you will find that the emotions are strictly analogous to that produced by an infringement of your own privileges; and the more powerful does the feeling become the stronger is the similarity."

This view was first publicly set forth in *Social Statics* (Chap. V) seven years later; and I have till now supposed that it was first entertained at the time that chapter was written. I had, in the meantime, become acquainted with Adam Smith's *Theory of Moral Sentiments*, and found that the doctrine of Sympathy had already been set forth by him; but it would seem that having reached it in the endeavour to explain Benevolence, I subsequently carried it on to explain Justice. I may add that this theory did not receive its complete form until 1891, when, in Part IV of *The Principles of Ethics*, Chap. IV, the nature of the alleged sense of personal rights was indicated.

An illustration of the general truth that we can always find reasons for doing that which we want to do, was furnished by me at this time. One of my first letters written home, expresses a resolution to republish, in pamphlet form, the series of letters to *The Nonconformist* on "The Proper Sphere of Government," and implies that I was occupied in revising them. The ostensible reasons for taking this step were, of course, that it would be for the public advantage that they should be made permanently accessible, and that the republication would probably pay its expenses. But the effective prompter doubtless was my desire for their survival—my reluctance to see these first products of my pen remain buried in the columns of a newspaper.

In their collected form they were issued towards the end of August, and the results well illustrated the absurd estimates made by the sanguine and inexperienced. That a pamphlet by an unknown writer, on a comparatively abstract subject, would make any difference in the course of men's thoughts, was a belief showing how large is the space which may be covered by a small object held close to the eye, and how great may be the consequent illusions. Utter ignorance of the book-trade, too, was shown in the idea that the sale of such a pamphlet would return the cost. This end is but rarely achieved even when the author is well-known and the topic popular: one reason being that, with a small publication, the cost of advertising bears to the total expenditure so much larger a ratio than with a publication of any size; and the other being that publishers will not take any trouble about pamphlets, which, as they say, are not worth "handling"—the trouble of selling is the same as for a larger book and the profit next to nothing. I experienced the effects of these causes. Perhaps a hundred copies were sold and less than a tenth of the cost repaid. The printer's bill was £10, 2*s.* 6*d.* and the publisher's payment to me on the first year's sales was fourteen shillings and three pence!

Of course I distributed copies to friends and to men of note, and of course the letters of acknowledgment from these last were carefully preserved; for, in an author's early days, expressions of opinion are valued. One copy went to Mr. Carlyle, which, strange as it seems to me, he acknowledged. Here is his note. The date shows that the copy must have been sent many months after publication; probably because I had been reading one of his books—*Sartor Resartus*, I believe.

"Chelsea, 20 May, 1844.

"Dear Sir—I have received your pamphlet, and hope to examine it with profit at my earliest leisure. There is something good and salutary in all utterances of men which recognize, in any way, the eternal nature of Right and Wrong. Would there were thousands and

millions of such men in this world; each struggling towards 'government' of his own little world in that spirit!

"With many thanks and good wishes,

"Yours very truly,

"T. CARLYLE."

I quote the letter because, profoundly averse as I am from Carlyle's leading ideas, and strongly as I have expressed myself in reprobation of his despotic temper and resulting love of despotic rule, and in reprobation of his contemptuous utterances about various men, it is but fair to express my appreciation of the sympathetic feeling occasionally manifested by him. I appreciate the more the manifestation of it through encouraging words to unknown writers, because, in these later years of my life, I have abundant experience of the trouble entailed by presentation copies. A book I usually acknowledge by a lithographed circular with some lines on the fly-leaf; and anything smaller than a book commonly gets no acknowledgment at all. Certainly, it but rarely happens that a pamphlet calls forth from me a note such as that which I received from Carlyle. What a strange mixture he was of harshness and sympathy!

My sojourn in London led to a renewal of intimacy with my two friends. With E. A. B——, who was at that time stationed at Woolwich, I spent an evening; and not long after attended the celebration of his 21st birthday at his father's residence in London: being chosen, as his chief friend, to propose his health. Of Jackson I saw a good deal. He had resumed his occupation of architect and surveyor; not, however, with much success. One result was that, having both of us a good deal of leisure, we took from time to time country walks—chiefly in the Northern environs of London.

An incident in the course of one of these walks is associated with a physiological fact which I have not seen

named, and which has some significance. Not long before, I had, either by accident or in pursuance of a speculation, been led to try the experiment of making a number of deep inspirations in rapid succession: inflating the lungs to their fullest extent, expelling the air, and instantly again inflating them. The result was to send the blood tingling to the finger ends; or, at least, I presume that the sensation of tingling was due to the action on the blood-vessels. I cannot remember whether any exhilaration was caused, or whether I simply entertained the belief that some increase of energy would be a consequence. But in the course of one of these walks I induced Jackson to try the experiment, and he immediately announced that a head-ache, under which he had been labouring, had ceased—an anæmic headache probably. The effects of artificially-exalted respiration must surely have been occasionally observed; but I have nowhere met with any account of them or interpretation of them. •I assumed at that time that the effect is chemical, but afterwards inclined to the belief that it is mechanical. It should be added that, though there may come beneficial results, I know, to my cost, that detrimental results also may be produced.

Others of the expeditions we made together were to picture-galleries. Jackson was an amateur artist of considerable skill, and I, at that time as always, was interested in pictures to the extent of going to all the annual exhibitions. In those days the Gallery of British Artists in Suffolk Street was usually worth a visit; and since 1843 there has remained with me the impression of a picture, contained in its exhibition of that year, by J. B. Pyne—a picture of the Menai Straits on a glowing summer's day. It was a grand one in respect of composition; and I never remember to have seen sunshine and heat so vividly rendered. Pyne received nothing like the recognition which he ought to have had. No art-critic of authority, or rather no art-critic who had made people believe him an *authority*, had

declared in his favour. And the public having no one to form an opinion for them, had no opinion.

Not long since, when conversing with a Royal Academician and a professed art-critic, I happened to name Pyne as an unappreciated man. "A kind of imitator of Turner, was he not?" said the Academician. "Better than Turner," I replied, to the astonishment of both. And thereupon arose a discussion in which my dissent from the unqualified praises commonly given to Turner was distinctly expressed. Not, indeed, that I denied his merits. These are doubtless great. Among his pictures there are many grand compositions: some of them, indeed, as "Childe Harold's Pilgrimage" and "Ulysses deriding Polyphemus," are poems; and there is poetical feeling pervading his works at large. Then, too, there is his variety —his Shakespearian variety one might call it—in which he immensely exceeds the mass of artists; most of whom continually repeat themselves in conceptions and in effects. But it is quite possible to admit his superiority while recognizing serious drawbacks.

One of these is the not rendering truly the broad general contrast between earth and sky. In saying this I have in mind sundry of his larger works, his multitudinous sketches, and the landscapes which fill his *Liber Studiorum* and *Harbours of England*, &c. In numbers of these the average tone of the air-region is as deep as the average tone of the solid ground-region beneath it. This is a fundamental error. With some exceptions the most important difference in every out-of-door scene, is that between the relative darkness of the lower part of the visible area and the relative lightness of the upper part. The objects filling the lower part yield no light to the eye save what they reflect from the upper part; and the source of light must necessarily be brighter than that which it lights. Save in cases where heavy clouds, coming up from the horizon, have overspread that part of

the sky towards which the spectator looks, while the sky behind him is still light—cases in which the surface in front receives more light from behind him than does the cloud overhanging it—the largest effect in a landscape is this greater darkness of the earth than of the sky; and, if this largest effect is not represented, there results an untruth which nothing can hide.

Beyond this serious error, too often made by Turner in the representation of natural appearances, there is frequently in his works a serious error of composition—an error in what we distinguish as Art. Many of his pictures are too full of details—of multitudinous objects too uniformly distributed. The essence of Art is contrast. Art, no matter of what kind, demands a proper adjustment of contrasts—broad contrasts, minor contrasts, small contrasts; and, in the plastic Arts, contrasts of form, contrasts of light and shade, contrasts of colour. A further kind of contrast is required—that between uniformity and variety—between simplicity and complexity—between the relatively uninteresting and the relatively interesting. Be it in architecture, sculpture, or painting, artistic effect can be obtained only by the association of parts which attract the eye in but small measure, with parts which greatly attract the eye; and one of the elements of attraction is the amount of detail. If detail is evenly scattered over the whole of the visual area, contrast is in so far destroyed. Only by concentrating the detail can it be produced. There must be much plainness to render decoration really decorative. This implies that in paintings there should be large areas which, if not without details, are occupied by details of a kind so inconspicuous that they draw little attention. One of the few artists whose pictures fully conform to this requirement, is Mr. Orchardson. Turner often ignored it. He had a restless desire to fill all parts of his canvas with minor effects; and he multiplied them to the extent of conflicting with the major effect, and pre-

venting the observer from grasping the picture as a whole.

So that, admiring Turner as I do, I yet contend that he frequently missed a great truth in Nature and too often sinned against a fundamental principle in Art. But Turner has had the good fortune—if it be a good fortune—to obtain the applause of one whose word has come to be law with the public on Art-matters; and, among those few who have any opinions of their own, scarcely any dare to express their dissent. Turner himself, however, saw how undue was the valuation of his work; and, towards the close of his life, ridiculed the public, saying laughingly—"They buy my freaks!"

The world is always wrong in its estimates of conspicuous men. They are always either greatly over-estimated or greatly under-estimated. When, after opinion has gone to the one extreme, there comes a reaction, it goes for a time to the other extreme; and then again the re-reaction is carried too far. Oscillations so caused continue through the ages, until, by the time opinion has settled into the rational mean, the man has dropped into oblivion. These variations—these exaggerations and depreciations of merit, are inevitable. There is as certainly a fashion in Art-judgments as there is a fashion in women's dresses; and, in the one case as in the other, the movement is now to excess in one way and now to excess in the opposite way—a result which must always follow so long as individuals dare not speak and act independently, but severally say and do that which they find the mass of people around say and do. This conduct leads to rushes, first this way then that way, in thought and action, according as one or other belief concerning the prevailing preferences becomes dominant. Rhythm is universal.

And here I may observe that recognition of rhythm in opinion about Art-matters, as about other matters, affords a means of correcting our judgments; since we may

generally see in which direction the pendulum is swinging, and may judge approximately to what extent it has swung beyond the position of equilibrium.

Having failed during nearly three months, to obtain any literary engagement, and having received nothing for such products of my pen as found their way into print, I was of course led to keep my eyes open in search of an engineering engagement, and some time in July found one.

Competition designs for some graving-docks at Southampton, had been publicly asked for by the West India Mail Steam-Packet Company; and, among others who responded to the invitation, was Mr. W. B. Pritchard. I undertook to aid him in making the drawings; or, rather, made the drawings under his superintendence. Between one and two months were, I think, thus occupied. Nothing came of the matter, however. Other designs were, I suppose, chosen. Thus any hope which I perhaps entertained of a permanent engagement came to an end. Later in the autumn there was, indeed, a second piece of work which I undertook for him—a design for a pier, I think it was. But from this there came no more result than from the other.

Competition designs are in all cases not hopeful things; since they are usually numerous, and since those who have to pass judgments upon them are often not among the most competent. In this case, however, I suspect that the faults were in the designs themselves; for Mr. W. B. Pritchard was not a man of much natural capacity, nor was he adequately prepared. How he came into the position which he seemed to occupy, I never could understand. He was not only deficient in the special culture required for engineering, but also in more general culture. I suppose he furnished an illustration of the success which may be achieved by audacity in pushing. He had in a

high degree that trait which I had in but a small degree, or rather, not at all.

My relations with him did not entirely cease with the completion of these designs. I subsequently undertook to revise the MS. of a work on Bar-Harbours which he had written—an MS. which required a good deal of editing before it was sent to press.

There remains to be named only one other incident connected with this sojourn in London—an incident, like others which I have named, implying more attention to public affairs than to private affairs.

Some two or three years had now elapsed since *The Nonconformist* had commenced urging the dissolution of the connexion between the Church and State: the motto of the paper being a sentence from Burke, I believe—"The Dissidence of Dissent, and the Protestantism of the Protestant religion." A considerable effect had been produced; for the writings of Mr. Miall had a logical coherence and persuasiveness not usually found in those of newspaper-editors. In the minds of a small section, opinion had so far ripened that the time for action was supposed to have come; and a few of the more ardent resolved to form a society having in view the objects which *The Nonconformist* advocated. I was among these few. Some private meetings were held; and it was decided to found a "Metropolitan Anti-State-Church Association." Secretaries were appointed, one of whom was Charles Miall, brother of Edward Miall. An address had to be written, and I was chosen to write it. Among my papers there still exists a copy which, perhaps, justifies the description given of it, in one of the dissenting papers of the time, as a fiery little document, or something to that effect.

This Metropolitan Anti-State-Church Association was presently merged in the Anti-State-Church Association at

large; which eventually, to avoid that appearance of antagonism which the prefix "Anti" gave, re-named itself "The Society for the Liberation of Religion from State Patronage and Control." Thus the writing of this address was the first overt step towards that agitation for disconnecting Church and State which has since been carried on.

The summer months had long since passed away and autumn had ended. November had come, and nothing had been achieved.

Had there been in me any of that same capacity for pushing in which, as just remarked, I am deficient, something might have been done. It seems strange that, with such engineering connexions as had been made, and with introductions of the kind which sundry articles in *The Civil Engineer and Architect's Journal* furnished, I should not have succeeded in finding a post of some kind. Evidently I took nothing like adequately decisive steps, but was very much in the mood of Mr. Micawber—waiting for something to turn up, and waiting in vain.

And now, after half a year had passed in this futile way, it became clear that a longer sojourn in London was out of the question, and I raised the siege.

CHAPTER XVII.

AT HOME AGAIN.

1843—44. ÆT. 23—24.

A SMALL incident, which left so faint a mark in memory that it would have disappeared wholly from the record had it not been for a reminder found among my papers, occurred shortly after my retreat from London.

During the autumn I had witnessed the birth of a new weekly paper, issued from the same printing establishment as *The Nonconformist;* at which, also, my pamphlet had been produced. It was entitled *The Philanthropist*, and was projected by a sanguine young fellow named Ritchie. My recollection is limited to its title; unless I add a surviving impression that its contents and its editing gave but small promise of success—a small promise which was very soon followed by its cessation. While I know of no effects otherwise caused by it, I am reminded, by the document above referred to, of its effect on me.

For this wild project of Mr. Ritchie suggested a project which was still wilder. Soon after my return home there arose in me the thought of a weekly paper to be called *The Philosopher.* Evidently the wish was father to the thought; for the thought could scarcely have arisen out of any rationally-framed estimate of success. Neither a sufficient public, nor fit contributors, nor adequate money, were likely to be forthcoming. There are, indeed, among the memoranda, the names of some who were to be asked to furnish capital, and of others who were to be asked to

write. But they could not have been set down otherwise than as a play of fancy. The fact of chief interest, however, is that there exists among these papers, a design for a heading to the projected journal. Such small amount of skill as I possessed in making ornamental letters, &c., I exercised. Evidently the whole thing must have been a day-dream—an imagination of something which I should have liked to do.

But the incident had a certain significance—it indicated the leanings. It foreshadowed the doings of subsequent years in a curious way—a way which seems the more curious when there is added the fact, now clearly recalled on thinking over the circumstances, that I had reserved for my own writing a series of "Essays on Principles": not, however, physical principles, such as those which at a future time were to be set forth, but politico-ethical principles.

Something speculative, but not so absurdly impracticable, at the same time or soon after occupied my attention —something of which I was not the originator, but proposed only to be the aider and abettor.

There was in my father's nature the peculiarity that, whereas he could be, and usually was, energetic about small things, he was never energetic about large ones. He appeared to be paralyzed by the contemplation of any step which involved serious issues. It may be that this trait did not originally exist, but was due to the nervous collapse he suffered soon after he was thirty; but more probably it was due to the activity of his constructive imagination, which led him to represent so vividly the many good and evil consequences, that he became perplexed and hesitating. In respect of his shorthand, this peculiarity had already been shown by letting year after year pass without doing anything towards publication of it; and it was clear that nothing would be done, unless it

was done for him. Hence it happened that, some time at the end of 1843, or beginning of 1844, I wrote a systematic account of it. The manuscript, ready for publication, I put into my father's hands; and I went so far as to attempt, by the electrotyping process, to produce some of the illustrations which otherwise would have required woodcuts. Among various odds and ends there still exists a fragment of one of the plates.

But there the matter stood. Though from time to time, during the remainder of my father's life, plans for publication were entertained, nothing was ever done by him.*

Of my readings during this period I have but slender recollections. *The Athenæum* and *The Mechanic's Magazine*, circulated among the members of the Methodist Library Committee (of which my father, oddly enough, still retained his membership) came round regularly; and there also came round the more important periodicals taken in by the Derby Philosophical Society—*The Lancet*, two medical quarterlies, *The Philosophical Magazine*, *The Cyclopædia of Anatomy and Physiology* (issued in parts), with, perhaps, some others. And beyond these there were the occasional books purchased by the Society: some of them popular, as travels, and others not of so readable a kind.

One of these last I remember making acquaintance with at the Society's Library—a large quiet room in St. Helen's Street, to which I occasionally resorted in the afternoon. This book was Mill's *System of Logic*, just purchased and

* For many years after his death, pre-occupation with my own work, continually demanding more of me than my disturbed health would bear, prevented me from carrying out the intention of seeing the work through the press myself: the difficulty of getting the illustrations properly executed being a chief deterrent. During a subsequent period, entire incapacity for attending to business of any kind, caused further postponement; and when, after partial recovery, the intention was revived, I could not find the manuscript. Quite recently the discovery of this has been followed by the resolution to delay no longer; and I have now (June, 1892), made arrangements with a wood-engraver to execute the illustrations.

not yet sent round to members. I remember reading his criticism on the syllogism and agreeing with it: perhaps all the more readily because it expressed dissent from an orthodox doctrine.

Another book should be named as having been read about this time—Carlyle's *Sartor Resartus*. It had been lent to me by Lott, who had become an admirer. The book made an impression, though it did not exercise any appreciable influence. The freshness of its presentations of things, and its wonderful vigour of style, attracted me. But I am not aware that any change in my views of life resulted. There are some who date back revolutions in their states of mind to the reading of Carlyle's works in those days; but they must have been much more readily impressible than I was—more receptive. Anything like passive receptivity is foreign to my nature; and there results an unusually small tendency to be affected by others' thoughts. It seems as though the fabric of my conclusions had in all cases to be developed from within—refused to be built, and insisted upon growing. Material which could be taken in and organized, or re-organized, so as to form part of a coherent structure in course of elaboration, there was always a readiness to receive. But ideas and sentiments of alien kinds, or unorganizable kinds, were, if not rejected, yet accepted with indifference and soon dropped away. This is in a considerable measure the nature of all who think for themselves; but this nature has ever been in me unusually pronounced.

There is proof that about this time, too, I made acquaintance with some essays of Emerson, which had recently been republished in England with an introduction by Carlyle. The proof is a passage in a letter written to Lott in 1844.

"I have read Emerson and have passed it on according to command. Here and there I met with passages that I was much pleased with, but as a whole it is rather too mystical to please me. As Carlyle says

his ideas are 'struggling towards an embodiment.' Certainly they have as yet only here and there attained it; his essays give rather the shadows of his thoughts than the thoughts themselves. But I greatly admire the spirit of the man though I cannot agree with many of his most prominent ideas. The doctrine indicated in various parts of the book that we attain truth by admitting into our minds the gleams of the 'universal soul' is somewhat analogous to the view (erroneously as I think) entertained by the Quakers respecting the promptings of the spirit; which promptings of the spirit are nothing more than the actings of their excited moral sentiments."

Subsequent reading of other collections of his lectures and addresses, less mystical in their characters, raised my estimate of Emerson. Out of the mass of his sayings, incoherent or but slightly coherent, as he himself remarked, there occasionally came one which impressed me and remained. That I enjoyed his essays is proved to me by the remembrance that some six months afterwards I read one of them aloud to a friend—a remembrance which doubtless owes its survival to the curious comparison my friend made. He said that the feeling produced in him was like that produced by distant thunder.

What it was which about this time turned my attention to the construction of watches, there is nothing to indicate. In the absence of memoranda, I should have referred this, among my many excursive occupations, to an earlier date; but one of the sketches, made on the back of a notice of a meeting appointed for November, 1843, prevents me. This sketch shows that a re-arrangement of the works with a view to greater flatness was one of the intentions; but most of the sketches referred to new forms of detached escapements. I name this because there resulted two working models of such new forms, constructed on a large scale—perhaps about six inches in diameter. One of them proved to have no superiority: indeed I believe it was a bad one. The other, however, worked with great regularity; having an advantage in the

mode of giving the impulse. It lay about the house for years, and was at length broken to pieces.

Some still-extant drawings remind me that not long afterwards there was a scheme for an improved form of printing press, or what seemed an improved form. But, unless it was in simplicity, I do not see what advantage the proposed arrangement had over the then-existing arrangements. From this scheme, however, which did not occupy much attention, there presently arose one which occupied a good deal of attention. Thoughts about the making of printing presses led the way to thoughts about the making of type.

To make type by compression, instead of by casting, was the idea. A machine was devised, if not in detail still in its general arrangements, which was to do the work rapidly and automatically; and it is clear from the documents still existing that I was sanguine in my anticipations: a fact which goes without saying—what inventor is *not* sanguine? Elaboration of plans went even to the extent of detailed costs and arrangements of an establishment for carrying on the manufacture. These estimates had been rendered necessary in the course of negotiations into which I was led. Sundry efforts to carry the scheme into execution were made. A letter to my father from Mr. Kershaw, a wealthy friend of his at Manchester, shows that an inquiry had been raised on my behalf concerning a possible capitalist. From Mr. Joseph Sturge, too, I find a note of April, 1844, showing that I had intimated to him that I was in search of either a type-founder who would adopt my plan, or some enterprising man who would advance sufficient money to give it a trial. One negotiation there was which went somewhat further; for it seems that I had resolved not to let the matter drop without using all available means. A letter to my aunt of 15 April says:—"I begin to see that under the present state of things there is no getting on without

a little *pushing*, and however disagreeable such policy may be to my own feelings (and it is exceedingly so) I expect I must make up my mind to adopt it." In pursuance of this resolution I wrote to Mr. Lawrence Heyworth of Liverpool (to whom, as already narrated, I had been introduced by my uncle at Birmingham), inquiring whether he knew anyone who would be able and willing to join in the projected enterprise. Mr. Heyworth responded in a manner which raised my hopes; and sundry letters passed between us. It appeared, eventually, that he had entertained the proposal in the belief that not impossibly the business might be of a kind suitable for one of his sons, at that time growing into manhood. But, after sundry inquiries on his part and calculations on mine, he came to the conclusion that the undertaking was not likely to prove extensive enough. Such, at least, was the ostensible reason given; though possibly—probably even—scepticism about success may have been a more influential motive.

There was nothing more to be done. If no help was forthcoming from some one to whom I was known, there was no likelihood of help from elsewhere; and so the matter dropped.

Along with speculations taking the direction of mechanical improvements, there went speculations having no relation to material results. At most times there was being pursued some line of thought having scientific or philosophical bearings; and the early part of 1844 was not unlike other times in this respect.

Not long before, a French chemist (Dumas, I believe) had drawn attention to the relation which exists between plant-life and animal-life: the one being carried on by decomposition of carbonic acid and water, assimilation of the carbon and hydrogen, and liberation of the oxygen; while the other is carried on mainly by oxidation of the carbon and hydrogen, and generation of carbonic acid and

water. A corollary from this view, which had not been named, occurred to me; and, in *The Philosophical Magazine* for February, 1844, I pointed it out in an essay entitled "Remarks upon the Theory of Reciprocal Dependence in the Animal and Vegetable Creations, as regards its bearing on Paleontology." Briefly stated, the idea set forth was that the vast deposits of carbon, existing in various parts of the world in the shape of coal-formations, having been produced by the abstraction, during past periods of the Earth's history, of carbon from the atmosphere, imply that in earlier times the proportion of carbonic acid in the atmosphere was greater than it is now. This article is reproduced in Appendix F.

Later in the Spring, or rather in the Summer, a subject quite remote in nature again afforded a field for speculation—Phrenology; in which my interest still continued, and in respect of parts of which I again enunciated heterodox views. The first of my heterodoxies was set forth in a brief article "On the Situation of the Organ of Amativeness," published in No. 6 of *The Zoist*, for July 1844. The argument contained in it was that a similar external appearance would be produced if, instead of amativeness being located in the cerebellum, as Gall alleged, it were located on the under-side of the cerebrum, overlying the cerebellum. A good deal more space was occupied in setting forth my second heterodoxy, in an article entitled "A Theory concerning the Organ of Wonder," which, written in June or July, was published in No. 7 of *The Zoist*, for October, 1844. Evidently the hypothesis which the article set forth, was prompted by dissatisfaction with the vagueness of the accepted belief concerning the function of the organ—"a function of confused, indefinite character," as I called it. Wonder could not, it seemed to me, be a primitive faculty; but rather a trait resulting from some large endowment of a faculty which had a distinct relation to life. The conclusion

reached was that the organ "has for its ultimate function the revival of all intellectual impressions," and is "the chief agent in imagination:" the name *Revivisence* being suggested as "the most descriptive name," though an awkward one.

Strangely enough, this essay, long ago buried and forgotten, was recently exhumed. To my great surprise, in the *Journal of the Anthropological Institute* for June, 1890, vol. xx (1891), p. 231, I met with the report of a paper read by Mr. Bernard Hollander of Vienna, in which he contended that this phrenological hypothesis of mine was verified by the experiments of Ferrier. Whether he was right in his contention I am not prepared to say; but he quoted from Prof. Ferrier the curiously congruous statement respecting excitements of the part, that "the movements indicated are essential to the revivification of ideas."

And now, at the beginning of August, there came a letter which initiated, first a brief change in the course of my life, and then a much longer change. The active part which I had taken locally in the Complete Suffrage Movement, before and after the Conference already described, had led to correspondence with Mr. Joseph Sturge, president of the Complete Suffrage Union; and this correspondence now had an unexpected sequence. An organ for the movement was thought needful; and it was also thought needful that there should be a local newspaper of more radical character than the newspapers which existed in Birmingham. The desire, or perhaps it should be called the resolution, to found such a paper, I first learned on August 6 from Mr. James Wilson, the secretary of the Complete Suffrage Union. Here is the essential part of his letter:—

"A few staunch friends of the cause are decidedly anxious to start a newspaper and are to subscribe the necessary funds to give it a fair trial. They have put the matter into my hands and devolve on me the responsibility of the editorship. I can only undertake to do this at

hours apart from the general business of the secretaryship of the C.S.U., and must therefore depend much on the efficiency of an assistant. Mr. Sturge and I had some conversation on this latter point, and having suggested you I thought well of the suggestion. The paper will be got up in a most respectable style, and from seven years' practical acquaintance with the details of editing and sub-editing, I shall hope to put the thing into such shape at once as would make afterwork comparatively easy. For the first six months it will be a paper of trial. If it succeed it will afford to pay itself thereafter. I mention this merely to show that the assistant-editorship would not afford that amount of remuneration which we could wish to offer to you."

In a letter of three days later came the passage:—

"With regard to your prospective position on the paper I have simply to say that as I have no one to control me nor dictate how or what I shall write it shall be my earnest desire not to cramp your energies by any stipulations as to subjects. . . . My time will be chiefly devoted to the secretaryship which will not be at all identified with the editing of the *Pilot*."

In so far as these statements concerned the nature of the post to be filled, they appeared quite satisfactory. The only unsatisfactory thing was the absence of any specified remuneration. As was pointed out in a letter from my uncle Thomas, written in the course of the next month, it was unwise "to enter upon a matter first and make terms afterwards." But I suppose my eagerness to be doing something prevented me from raising a difficulty of any kind.

Thus, wisely or unwisely, I closed with the proposal made to me, and migrated to Birmingham before the end of August.

PART V

CHAPTER XVIII.

A BRIEF SUB-EDITORSHIP.

1844. ÆT. 24.

THE editor of the projected newspaper, Mr. James Wilson, had suggested that I should, for a time at any rate, reside with him; but, as his domestic arrangements were temporarily dislocated by the absence of his wife in Scotland, it was arranged that the early part of my sojourn in Birmingham should take the form of a visit to Mr. Joseph Sturge. There resulted a number of pleasant days passed in his house at Edgbaston.

I retain a clear recollection of his remarkable face, uniting, in an unusual way, great kindness with great firmness: beneath an overhanging brow, eyes expressive of much sympathy, and then a very massive chin. The determination implied by the massive chin took the form of unyielding pursuit of his benevolent aims. Already I had received a favourable impression of him, and closer knowledge made it more favourable still, as witness the following passage in a letter to my friend Lott:—

"You would be delighted with Mr. Sturge did you know as much of him as I now do. He is one of the most lovable kind of men in his social and domestic character that I have yet come in contact with; perfectly open, simple and amiable, he is as genuine a Christian, in the practical sense of the term, as could well be imagined."

I am glad that the occasion occurs for thus describing him, since his name is scarcely known to the present generation. Had he "chastised" wild tribes who did not quietly yield to our intruding explorers, or had he picked

a quarrel with some native king, broken up his government, and presently appropriated his territory, or had he bombarded the fortifications of a people who would not submissively accept our administration of their affairs, he might have been rewarded by a grateful nation, and his memory cherished. But he did none of those things. He only devoted persistent energies to the abolition of slavery, and then laboured to mitigate the sufferings of kidnapped negroes—did nothing more than spend time, money, and life, in promoting human welfare at home and abroad.

Connected with my residence in the house of Mr. Wilson, which shortly followed, there is but one incident worth recalling.

Up to this time I had never paid any attention to mental philosophy, save under the form of phrenology; respecting some doctrines of which my criticisms, as we have seen, imply a leaning towards subjective analysis. But the science of mind had no temptation for me, otherwise than as affording these occasions for independent judgment: there had never been any deliberate study of it. All through my life Locke's *Essay* had been before me on my father's shelves, but I had never taken it down; or, at any rate, I have no recollection of having ever read a page of it. My glance over a small part of Mill's *Logic*, named in a preceding chapter, had, indeed, shown that there was a latent interest in psychological questions of the intellectual class; but nothing more had come of it. Now, however, I was led to consider one of the cardinal problems which the theory of human intelligence presents.

For I found in Mr. Wilson's house (rather oddly, as it seemed, for there was not a *soupçon* of philosophy in him) a copy of a translation of Kant's *Critique of Pure Reason*, at that time, I believe, recently published. This I commenced reading, but did not go far. The doctrine that Time and Space are "nothing but" subjective forms,—

pertain exclusively to consciousness and have nothing beyond consciousness answering to them,—I rejected at once and absolutely; and, having done so, went no further. Being then, as always, an impatient reader, even of things which in large measure interest me and meet with a general acceptance, it has always been out of the question for me to go on reading a book the fundamental principles of which I entirely dissent from. Tacitly giving an author credit for consistency, I, without thinking much about the matter, take it for granted that if the fundamental principles are wrong the rest cannot be right; and thereupon cease reading—being, I suspect, rather glad of an excuse for doing so.

Though I was not clearly conscious of them, there must have been two motives prompting this summary dismissal. There was, in the first place, the utter incredibility of the proposition itself; and then, in the second place, there was the want of confidence in the reasonings of any one who could accept a proposition so incredible. If a writer could, at the very first step in his argument, flatly contradict an immediate intuition of a simple and direct kind, which survives every effort to suppress it, there seemed no reason why, at any and every subsequent stage of his argument, he might not similarly affirm to be true a proposition exactly opposite to that which the intellect recognizes as true. Every coherent body of conclusions is a fabric of separate intuitions, into which, by analysis, it is decomposable; and, if one of the primary intuitions is of no authority, then no one of the secondary intuitions is of any authority: the entire intellectual structure is rotten.

I must have dimly felt then what I afterwards clearly saw, and have set forth in *The Principles of Psychology*, §§ 388—391—the fact that belief in the unqualified supremacy of reason is the superstition of philosophers. Without showing any warrant, or making any attempt to show a warrant (there being in fact no warrant to be shown), they

assume that in each step throughout an argument, the dependence of conclusion upon premises, which in the last resort is an intuition, has a validity greater than that of any other kind of intuition: the truth being, contrariwise, that it has a smaller validity. A simple intuition, such as that by which we apprehend Space as external, has a clearness and strength transcending the clearness and strength of any intuition by which we see, internally, that, given certain data, a certain inference follows; and still more has it a clearness and strength immensely transcending that of a series of such internal intuitions, constituting an argument. All that it is competent for reason to do, as a critic of external perception, is to re-interpret its *dicta* in such way as to make them consistent—not, for instance, to deny the apparent motion of the Sun through the heavens from East to West, but to show that this apparent motion may equally be produced by the motion of the Earth round its axis from West to East; and that this interpretation of the appearance is congruous with various other perceptions, which the original interpretation is not.

But I am digressing too much. It remains only to say that whenever, in later years, I have taken up Kant's *Critique of Pure Reason*, I have similarly stopped short after rejecting its primary proposition.

But what about *The Pilot?* Well, there is not much to be said. After various mischances—breaking down of the printing machine and so forth—the paper was launched on the 28th September, and thereafter went on for a time with regularity.

Beyond discharging my functions as sub-editor, I did my share in the writing of leading articles. Among those which came from my pen, I find mentioned in letters, or otherwise identified, the following:—"Railway Administration"; "A Political Paradox"; "*Magisterial Delinquencies*"; "A Political Parable and its Moral"; "*Honesty*

is the Best Policy"; "The Impolicy of Dishonesty"; and "The Great Social Law."

In these articles I observe only one thing worthy to be named—the growth of a certain belief, already vaguely indicated two years before in the letters on *The Proper Sphere of Government*, and now more clearly expressed. In the article entitled "Honesty is the Best Policy," contending that this truth holds more certainly of a society than of an individual, since in a society evil reactions cannot be escaped, it is said:—"The life and health of a society are the life and health of one creature. The same vitality exists throughout the whole mass. One part cannot suffer without the rest being ultimately injured."

But now, after about a month, the sub-editing and the writing of leaders, were alike suddenly cut short in a quite unexpected way.*

* With the history of this brief engagement, may here be joined mention of an instructive incident, which occurred nearly half a century later.

Mr. Wilson, a native of Aberdeen, who in after years became the Rev. Dr. Wilson, continued, after he came to reside in London, to send occasional contributions to *The Aberdeen Free Press*, with which he had, I believe, been connected in his early days. One of these contributions, called forth by the death of Mr. John Bright, gave some small personal reminiscences of him, dating back to the days of the Anti-Corn Law League, which were also the days when *The Pilot* was established. Though it had little relevance to his subject Dr. Wilson brought in my name. One of his statements concerning me was that I had written in *The Pilot* a series of articles on "Sociology." On reading this statement, which, along with others from *The Aberdeen Free Press*, was re-produced in *The Pall Mall Gazette* of April 2, 1889, I received a serious shock; for, trivial in itself, it had for me a grave implication.

Ever since the publication of *Social Statics*, the disciples of M. Comte have assumed and alleged my indebtedness to him; though I have more than once said that when that work was written he was to me but a name. Now this statement of Dr. Wilson, evidently volunteered without bias, seemed to furnish conclusive proof that I was acquainted with the writings of M. Comte in 1844; since the word "Sociology" had been first used by him in his "Positive Philosophy," and was not at that time current in England. I knew Dr. Wilson's assertion, honestly made though it doubtless was, to be absolutely untrue—that I had used no such word. But how to prove this—how to rebut evidence which appeared so strong? Though

with little hope, I forthwith instituted inquiries in Birmingham: thinking that there, if anywhere, a file of *The Pilot* might be preserved. But none was to be heard of. Then arose the thought of the files of newspapers in the British Museum. But I was assured that no chance existed of finding there the successive numbers of a short-lived provincial journal dating back 45 years. Fortunately I ignored this opinion, and discovered that the Museum did contain a file of the paper: my anxiety being thus at once removed.

Singling out the leading English Comtist, Mr. Frederic Harrison, I wrote to him requesting that he would find some fit man, unknown to me, who, under his instruction and without knowledge of the purpose for which the inquiry was made, or of the person on whose behalf it was made, should go to the Museum, and copy out the titles of all the articles published in *The Pilot* during its year and a half of life. This he did. The list was written out; Mr. Harrison read it through; and he then wrote to me, testifying that my memory was correct—that there was no such word as "Sociology" to be found in them. These facts I published in a letter to *The Pall Mall Gazette* of April 12, 1889.

Had not this slender thread of evidence been preserved unbroken, my word would thereafter have been held valueless.

CHAPTER XIX.

A PARLIAMENTARY SURVEY.

1844. ÆT. 24.

FOR what reason, and in what way, my engagement on *The Pilot* was so unexpectedly broken—temporarily as intended but permanently as it proved—will best be shown by a letter written to my father on the 30th of October, 1844.

"Probably you will wonder at receiving a letter from me dated Dudley, and will doubtless be still more surprised to hear that I have returned for a few weeks to my old profession.

"You must know that, something like a fortnight ago, Mr. Hughes (whom you probably remember as my old superior on the B. and G. Railway), called on me at *The Pilot* office, and told me that he had heard from Edmund Sturge that I was in Birmingham, and that he had called to know whether I could come and assist him in making a survey of a branch from the B. and G. Railway to pass through Droitwich, Kidderminster, Stourbridge, Dudley, and terminating at Wolverhampton. After thanking him for the offer I told him that I was then engaged with Mr. Wilson, and that, even did I think it desirable, I could not honourably leave him without due notice; and, as he wanted me immediately, I was compelled to decline the offer. This I did the more readily as the engagement was only a temporary one, consequent upon the making of the parliamentary survey, which has to be concluded by the end of November.

"With this interview the matter, as I supposed, terminated. However, on Saturday last Wilson told me that the Sturges had been talking with him about the matter, and that, in consequence of the scarcity of engineers during the present railway mania, Mr. Hughes was very anxious to have me, and had commissioned Edmund Sturge to endeavour to make some arrangement. The matter ended in Wilson's agreeing to liberate me for a month on condition that Joseph

Sturge liberated him from his duties as secretary to the C.S.U. This he had no difficulty in doing, as there is nothing stirring in that matter just now, and Wilson will be able for a short time, with the assistance of a reporter he is about to employ, to go on without me.

"And so here I am booked for a month's hard work in surveying and levelling. I am to be paid at the usual rate for such work, namely, a guinea a day and my expenses paid, so that I shall be able to get a little stock in hand by the undertaking. I daresay a month's out of door work will do me no harm, either, on the score of health. Not that I was wanting it, for I have been very well ever since I left home."

Little need to be said concerning the work I had to do in making, first the trial section, and then the permanent section, between Stourbridge and Wolverhampton—work which occupied me during a good part of November. I may remark only that the country traversed was one of the worst imaginable—a jumble of coal-pits, iron works, cinder-heaps, tramways, canals, lanes, streets, ground which had subsided and houses which were cracked in consequence of the abstraction of coal from beneath; and that the levels had to be taken in the midst of wind and rain and more or less smoke.

Nor need I dwell on the week or ten days ending November which were spent at The Swan, Birmingham—then the chief old-established hotel. There, in company with Mr. Hughes and other members of the late B. and G. staff—Loch, Harrison, Bishopp—I helped to carry on the process of preparing the plans, to be deposited at the end of the month. In this case, as in all such cases, there came towards the close a good deal of unceasing work: the day being eked out by many hours of the night. For it is with the getting up of plans for Parliament, as it is with the starting on a journey—however much time is taken in preparation, there is always hurry-scurry at the last.

After the end of November my letters for a considerable interval are dated 12, Waterloo Street, Birmingham. Further routine work had to be done, in the preparation

of parish-plans, &c.; and the getting of this work done Mr. Hughes left to me.

How my engagement with *The Pilot*, which was to be only suspended for a month or so, finally lapsed, I cannot remember. Possibly a representation was made to the Sturges, interested alike in the railway and in the journal, that my engineering services could not be dispensed with; and possibly there existed an unexpressed feeling which led them the more readily to yield to the alleged need. During my visit to Joseph Sturge, he received a considerable shock on discovering how profoundly at variance were our views about religion. Some question of his brought out a confession of my rationalism; and I suspect that on this disclosure he repented that he had been instrumental in bringing me to Birmingham. The reason, however, was not one which could be assigned for cancelling the engagement, and nothing was done: friendly feeling being very well maintained notwithstanding this manifestation of disbelief, which he doubtless thought so shocking. But now that there occurred a demand for my aid in another direction, probably he and his brothers, with whom he co-operated, rather rejoiced that my journalistic functions might conveniently end. Though there was entire sympathy on their part with all that I had written in *The Pilot*, yet the consciousness of disagreement on so all-important a matter must have been a cause for dissatisfaction.

And so I quietly reverted for a time to my previous profession. Through December, January, February, and March (if sundry short breaks are omitted) my life alternated between lodgings in Edgbaston and the office in Waterloo Street; where, presently, my duties became little more than nominal.

Mr. Lawrence Heyworth has been mentioned as one with whom acquaintance was made at the Birmingham

conference, and with whom I had, a year or more after, some correspondence respecting the carrying out of an invention. During December, 1844, there arose an indefinite suggestion that I should visit him; and at the end of the year this suggestion became a definite one: the result being that the first few days of 1845 were spent at his house, Yew Tree, near Liverpool. When writing to my father subsequently I said—

"Mr. Heyworth and I had a great deal of conversation, and on the whole agreed remarkably well in our sentiments. He is a particularly liberal-minded and thinking man, and, though nominally a Churchman, is practically no more one than I am myself."

A letter to Lott dated 1 February, after giving an allied characterization of Mr. Heyworth, proceeds to give two characterizations which are of much more importance.

"I was, however, most highly pleased with his daughter and her husband—Mr. and Mrs. Potter. They have been lately married, and appear to me the most admirable pair I have ever seen. I don't know whether you ever heard me mention Miss Heyworth as being somewhat of a notability. I have, however, been for some time past curious to see her, partly in consequence of the very high terms in which my uncle Thomas has always spoken of her, and partly because I have once or twice seen her name mentioned in the papers as one who was very zealous in the anti-corn-law agitation; engaging herself in distributing tracts and conversing with persons on the subject.

"It would never be inferred from her manner and general appearance that she possessed so independent a character. She is perfectly feminine and has an unusually graceful and refined manner. To a phrenologist, however, the singularity of the character is very obvious. [Here follow a profile outline of her head and a set of inferences.]

"Mr. Potter, however, commanded my highest admiration. He is I think the most lovable being I have yet seen. He is evidently genuine. His amiability is not that of manner but that of reality. He has a noble head—a democratic one of course [his earlier life and his later life might be cited as opposing evidences on this point]—but one so beautifully balanced in other respects that one can quite delight in contemplating it. The perfect agreement between his head and face is remarkable: the features are Grecian and their expression is exactly what a phrenologist would anticipate.

"He is I believe very poetical—admires Shelley enthusiastically and conceives him by far the finest poet of his era, in which I quite

coincided with him. In fact we sympathized in our sentiments on all subjects on which we conversed, and although I might feel somewhat flattered by this, I must say that I felt so strongly the beauty of his disposition as contrasted with my own, that I felt more dissatisfied with myself than I have done for a long time past."

For the reproduction of these passages there is a very sufficient reason. The friendship thus initiated lasted until the deaths of both. It influenced to a considerable extent the current of my life; and, through their children and grandchildren, influences it still.

Both on my own behalf and on behalf of my friend, I ought perhaps to say that the great admiration of Shelley above indicated did not continue. He, in after years, lost it almost entirely; and in me it diminished considerably. Why this was I do not feel certain.

Here I may fitly seize the occasion for saying something about my tastes in poetry. A good deal of the feeling which, in a letter to my friend Lott concerning "Prometheus Unbound," prompted the sentence—"It is the only poem over which I have ever become enthusiastic," was, I believe, due to the fact that it satisfied one of my organic needs—variety. I say organic, because I perceive that it runs throughout my constitution, beginning with likings for food. Monotony of diet is not simply repugnant; it very soon produces indigestion. And an analogous trait seems to pervade my nervous system to its highest ramifications. Both the structure as a whole and all parts of it, soon reach their limits of normal activity, beyond which further activity is alike disagreeable and injurious.

Whether the fact is rightly to be explained thus or not, the fact itself is unquestionable. Even in my boyhood I had a dislike to ballads with recurring burdens; and as I grew older this dislike grew into a disgust which rose almost to exasperation. There was a kind of vicarious shame at this inane repetition of an idea. I recognize, indeed, a few cases in which repetition, when emphasizing

a continuously-increasing feeling, is appropriate and very effective; as, for instance, in Tennyson's "Œnone"—"O Mother Ida, hear me ere I die." But usually the repetitions which characterize popular poetry are meaningless, and imply a childish poverty of thought.

Originating, as it seems, in a kindred way, has ever continued an indifference to epic poetry—a want of liking, due in part to the unchanging form of the vehicle and in part to the inadequately varied character of the matter: narratives, incidents, adventures—often of substantially similar kinds. My feeling was well shown when, some twenty years ago, I took up a translation of the *Iliad* for the purpose of studying the superstitions of the early Greeks, and, after reading some six books, felt what a task it would be to go on—felt that I would rather give a large sum than read to the end. Passing over its tedious enumerations of details of dresses and arms, of chariots and horses, of blows given and received, filling page after page —saying nothing of the boyish practice of repeating descriptive names, such as well-greaved Greeks, long-haired Achæans, horse-breaking Trojans, and so forth (epithets which when not relevant to the issue are injurious); passing over, too, the many absurdities, such as giving the genealogy of a horse while in the midst of a battle; and not objecting that the subject-matter appeals continually to brutal passions and the instincts of the savage; it suffices to say that to me the ceaseless repetition of battles and speeches is intolerable. Even did the ideas presented raise pleasurable feelings, a lack of sufficiently broad contrasts in matter and manner would repel me. The like holds with other epic poems—holds, too, when the themes are such as appeal to my sympathies. When reading Dante, for instance, I soon begin to want change in the mode of presentation and change in the quality of the substance, which is too continuously rich: a fabric full of

beauties but without beauty in outline—a gorgeous dress ill made up.

Another requirement:—All poetry which I care to read must have intensity. As I have elsewhere said—"While the matter embodied is idealized emotion, the vehicle is the idealized language of emotion"; and, thus regarding emotion as the essence of poetry, it has always seemed to me that an indispensable trait in fine poetry is strong emotion. If the emotion is not of a pronounced kind, the proper vehicle for it is prose; and the rhythmical form becomes proper only as the emotion rises. It is doubtless for this reason that I am in but small measure attracted to Wordsworth. Admitting, though I do, that throughout his works there are sprinkled many poems of great beauty, my feeling is that most of his writing is not wine but beer.

In pursuance of the conception just indicated, I have occasionally argued that the highest type of poetry must be one in which the form continually varies with the matter; rising and falling in its poetical traits according as the wave of emotion grows stronger or becomes weaker —now descending to a prose which has only a suspicion of rhythm in it, and characterized by words and figures of but moderate strength, and now, through various grades, rising to the lyrical form, with its definite measures and vivid metaphors. Attempts have I think been made to produce works having this heterogeneity of form, but with no great success: transcendent genius is required for it.

About others' requirements I cannot of course speak; but my own requirement is—little poetry and of the best. Even the true poets are far too productive. If they would write only one-fourth of the amount, the world would be a gainer. As for the versifiers and the minor poets, they do little more than help to drown good literature in a flood of bad. There is something utterly wearisome in

this continual working-up afresh the old materials into slightly different forms—talking continually of skies and stars, of seas and streams, of trees and flowers, sunset and sunrise, the blowing of breezes and the singing of birds, &c.—now describing these familiar things themselves, and now using them in metaphors that are worn threadbare. The poetry commonly produced does not bubble up as a spring but is simply pumped up; and pumped-up poetry is not worth reading.

No one should write verse if he can help it. Let him suppress it if possible; but if it bursts forth in spite of him it may be of value.

As a helper in completing the plans of the proposed line, there was mentioned above Mr. W. F. Loch: one of those referred to but not named at the beginning of Chapter X. Another of the old B. and G. staff, Mr. G. D. Bishopp, had married Loch's sister; and Loch was residing with them at Edgbaston. Some additional years of experience of life had sobered him a good deal; and one result was that there presently grew up a friendship between us which has lasted from that time to this. After the end of November he had nothing to do; and, when the work which December brought had been completed, nothing remained for me either beyond a formal attendance. I was retained rather with a view to contingencies than from any immediate need.

Hence it happened that during the early months of 1845, we saw a good deal of one another. Having taken to geology, he had gained some acquaintance with the formations round Birmingham; and the common interest thus established between us, led to geological excursions here and there. One was to the Clent Hills—I think that was the name—where an extrusion of trap had taken place in remote times. A curious structure called "The Wren's Nest," near Dudley, was the goal of another expedition.

And then, besides long walks such as these implied, there were more numerous and shorter walks about the environs of Birmingham. Discussions were not infrequent concomitants—political and religious discussions more especially. At that time Loch retained the beliefs given him by his education, and we were in constant opposition—he, orthodox and a Tory, I heterodox and a Radical—I, shocked at his harsh way of talking about the people, he shocked at my heretical ideas. Our debates had, like most debates, but small results: those on religion, especially, being futile from lack of a common standing-ground. For his faith he assigned the usual reasons—cited history and the Christian evidences. I, ignoring these, referred continually to the necessities of things, the order of nature, the uniformity of causation, as the grounds for disbelief. And so our fight was carried on in two different elements; neither hitting the other to any purpose. In course of time, however, my friend was forced to abandon his beliefs; not by any such reasonings as I used, but by an invasion carried into what he thought his strongholds. A letter of mine to Lott, written some years after, giving an account of the matter, is worth quoting:—

"I do not remember whether I have told you that the question of revelation has been for these three years past a constant subject of debate between Loch and myself, and that we made but little progress towards an agreement in consequence of his not putting much faith in the abstract arguments of the origin of will, of belief, and of motive, and the inferences to be thence drawn, which to me were so conclusive of the question; and of my not attaching much weight to arguments derived from historical evidence. Last spring he (Loch) had been reading Paley's *Evidences* and told me that he thought it almost unanswerable, but that he would be very glad to read any analogous work on the opposite side of the question. I recommended Strauss's *Life of Jesus*. He has been three months in reading it—has examined every reference, every quotation, and every argument, with the greatest care, and now confesses that it has thoroughly convinced him. It has, as he expresses it, taken him completely in the flank, by following a much more fundamental line of argument than that taken by Paley. Paley's object was to prove the authenticity of the gospels by historical

evidence. Strauss, on the other hand, assumes their authenticity, and then proceeds, by a comparison and examination of their internal evidences, to prove that there is no reliance to be placed on the correctness of their narratives; and Loch says that what the *Westminster Review* says of the work is perfectly true—namely that after reading it, all [that] had before looked so clear, simple, and straightforward, becomes a misty chaos of contradiction and uncertainty."

Returning to the discussions we carried on during these excursions round Birmingham, I may add that sometimes the moral implications of the question were entered upon: he contending, as is commonly done, that in the absence of revelation there would be no knowledge of right and wrong; and I, contrariwise, contending that right and wrong are determined by the nature of things, and may be deduced from it. I still remember his loud laughter when I, on one occasion, said that the moral Euclid remained to be written.

As all who have read thus far have perceived, I usually quote only the essential parts of letters; thinking it useless to occupy space with addresses and signatures, and undesirable to waste the reader's attention over superfluous passages. But occasionally there comes a letter all parts of which have one or other significance, and which it is therefore desirable to quote in full. Here is one of this class, written from Birmingham on 18 March, 1845.

"My dear Lott,

"You fully succeeded in raising my curiosity to boiling point by your three-page prelude to the tit-bit of news. 'Botheration to him,' I every now and then exclaimed as I found myself baulked, just as I thought I was coming to the pith of the matter, by some new prefatory remarks—'when will he come to the point?' Truly, I was strongly reminded of the scenes we oftentimes find depicted in old novels, where some garrulous domestic charged with the delivery of news of vital importance, edifies his breathlessly-anxious listeners with introductory reminiscences concerning something that his or her grandmother had seen or heard talk of.

"Great however as were my anticipations concerning the extraordinary interest of the promised intelligence, they were wholly transcended by the reality. Had you seen the height to which my

eyebrows were elevated, you would have been in fear lest they should never find their way down again. Probably they would have reminded you of Mr. B——'s when he sings 'Fly away.' And then, after all when they did settle themselves to their usual level, I began —I began—what will you say to me when I confess that—that I began to laugh! Why I laughed I really cannot say. You know that I consider myself somewhat of an adept in the analysis of feeling, but I own that in this case I am at fault. I think my laughter chiefly proceeded from sympathy with you, and it may be that it partly arose from the incongruous image that immediately presented itself to my mind of so sedate a young man as yourself making a declaration; for I must own that to me a declaration always carries with it a spice of the ludicrous, and I have a considerable horror of making one myself, partly on that account.

"After my laughter had subsided, however, I began to feel rather envious, seeing that you who are three years my junior should have already found someone to love you, whilst poor I am for aught I can see far enough from such a desideratum. I often feel melancholy enough at not having yet found any one to serve for the type of my ideal, and were it not that I make up the deficiency as well as I can by anticipations of future happiness, I should scarcely think existence worth having.

"I do not think you can entertain much fear as to my criticism upon your choice. You know I have a very high opinion of Emily Roe, and I think you might have sought far before you found one so well suited to you. Now that I consider it there appears to be much harmony of feeling and sentiment between you, and this is perhaps one of the first essentials to permanent happiness. The difference of age is the only drawback that I see, and perhaps one's notions on this point originate more in popular prejudice than in reason. You have had abundant opportunity of studying each other's characters; and I should say that the knowledge thus obtained will be a guarantee for matrimonial felicity (how very odd that term seems by the way as applied to you).

"I little thought that the conversation we had upon the subject of marriage when you were here, was of such immediate interest to *you*. Now that I do know it, however, I almost think I must recapitulate *for your especial benefit*, the opinions I then expressed; so here goes.

"1. You agree I believe with Emerson that the true sentiment of love between man and woman arises from each serving as the representative of the other's ideal. From this position I think we may deduce the corollary that the first condition to happiness in the married state is *continuance of that representation of the ideal;* and hence the conduct of each towards the other should always be so re-

gulated as to give no offence to ideality. And on this ground I conceive that instead of there being, as is commonly the case, a greater familiarity and carelessness with regard to appearances between husband and wife, there ought to be a greater delicacy than between any other parties.

"2. There should be a thorough recognition on both sides of the equality of rights, and no amount of power should ever be claimed by the one party greater than that claimed by the other. The present relationship existing between husband and wife, where one claims a command over the actions of the other, is nothing more than *a remnant of the old leaven of slavery*. It is necessarily destructive of refined love; for *how can a man continue to regard as his type of the ideal a being whom he has, by denying an equality of privilege with himself, degraded to something below himself?* To me the exercise of command on the part of the husband seems utterly repugnant to genuine love, and I feel sure that a man of generous feeling has too much sympathy with the dignity of his wife to think of dictating to her, and that no woman of truly noble mind will submit to be dictated to.

"3. The last important condition I hold to be the forgetting, to as great an extent as possible, the existence of a legal bond, and the continual dependence upon the natural bond of affection. I do not conceive the most perfect happiness attainable while the legal bond continues; for as we can never rid ourselves of the consciousness of it, it must always influence our conduct. But the next best thing to destroying it is to banish it from our minds, and let husband and wife strive to act towards each other as they would were there no such tie.

"If men were wise they would see that the affection that God has implanted in us is amply sufficient, *when not weakened by artificial aid*, to ensure permanence of union; and if they would have more faith in this all would go well. To tie together by human law what God has tied together by passion, is about as wise as it would be to chain the moon to the earth lest the natural attraction existing between them should not be sufficient to prevent them flying asunder.

"There! I hope you will duly cogitate upon my lecture. Perhaps it may not be quite the thing to talk to a lover about the philosophy of love. I rather think, however, that it is well in all cases to let practice be guided by some theory rather than by nothing; and I think it is well for all incipient Benedicts to get definite opinions upon the matter.

"But whatever theory you may adopt I think you will believe me when I say that I hope the result may be abundant happiness; and if I should be so fortunate as to be able to accelerate that happiness, I assure you it will be a matter of great gratification to me.

"We are still here in a state of uncertainty, but I am in daily expectation of the matter being determined. If it is settled favourably

we shall go up to London immediately. If otherwise you will in all probability soon see me at Derby.

"I lately bought Shelley's poems in four volumes. It will be a great treat to you to read them, which you shall do the first time I come over. His 'Prometheus Unbound' is the most beautiful thing I ever read by far.

"There is a book not long since published called 'Vestiges of the Natural History of Creation' which I heard very highly spoken of by a gentleman at Liverpool, who was evidently a good judge. From what I hear I think you would like it. Would it not suit the Mechanics?

"I am sorry to hear that your sister is still so delicate. But we may hope that the return of warm weather will effect a restoration. Give my kind regards to her and your mother, and also to the ladies over the way; and receive yourself all appropriate congratulations and good wishes from

"Your affectionate friend,

"HERBERT SPENCER."

Respecting the contents of this letter it seems proper to remark that at the age of 73, one must not be held bound to *all* the opinions one expressed at the age of 24.

During January, February, and March, 1845, our railway scheme had been in a state of suspended animation. The times were those during which the chief railway companies were fighting for territories—poaching upon one another's manors: aggression being followed by counter-aggression. The Great Western Company was going to Parliament for powers to make the Oxford, Worcester, and Wolverhampton line—a line which threatened to compete injuriously not only with the North Western, but also with the Birmingham and Gloucester (or was it the Midland? for an expression in one of my letters suggests to me that possibly the amalgamation had at that time taken place). A result of this invasion on the part of the Great Western, was the getting up of the scheme with which I was connected—a line starting from Worcester and running through Droitwich, Kidderminster, Stourbridge, and Dudley to Wolverhampton. During these early months of 1845 there was, I suspect, some kind of negotiation going

on. At any rate there was considerable doubt whether our line would be proceeded with—a doubt which, in the mind of Mr. Hughes, became so complete a disbelief that on the 20th March he sent me an account of what was due for my services, with the promise to send me a cheque in a few days when he received his own.

Suddenly, however, there came a transformation scene; as is implied by the following paragraph in a letter to my father dated 31st March:—

"It is well that I did not return to Derby with you, as you proposed when you were here; for the day after you left this, news arrived that we were to proceed with our bill, and on the following morning I had to go off express to Pembroke to see Mr. Hughes."

The letter then proceeds to describe how I went by rail to Gloucester, by coach to Carmarthen, and thence by post-chaise to Pembroke. But the expedition is best pourtrayed in a letter subsequently written to Lott:—

"And first I must not forget that just after I last wrote to you I had a very agreeable journey into South Wales. I wish you had been with me. Your poetical feelings would have had a great gratification. A day's journey through a constantly changing scene of cloud-capped hills with here and there a sparkling and romantic river winding perhaps round the base of some ruined castle, is a treat not often equalled. I enjoyed it much. When I reached the seaside, however, and found myself once again within sound of the breakers, I almost danced with pleasure. To me there is no place so delightful as the beach. It is the place where, more than anywhere else, philosophy and poetry meet—where in fact you are presented by Nature with a never-ending feast of knowledge and beauty. There is no place where I can so palpably realize Emerson's remark that 'Nature is the circumstance which dwarfs every other circumstance.'

"I was most interested during my journey in observing the features and characteristics of the Welsh; and one circumstance I noticed will amuse you. A country girl travelled for a few miles by my side on the top of the coach, and, after making sundry enquiries as to the peculiarities of the people, I ventured to ask her whether she was partly Welsh herself. 'Yes,' said she laughing, 'I am half and half.' And what do you think led me to ask the question? She was very like you. I fancied I could detect in various faces in the towns we passed through, the same cast of features, which, as I took it, indicated the mixed race. I admired them much (now don't accuse me of flattery)."

Returning from Tenby by way of Bristol and London (to see Mr. Hughes), I reached Birmingham before the end of the month, merely to leave it again almost immediately. A letter to my uncle Thomas dated 1 April says:—

"We are now about to spend a few days in walking over the line to refresh our memories with what may have been forgotten, and we are then to proceed to London to enter upon the parliamentary business."

Here I am shown how dangerous it is to say that an incident never happened because there is no recollection of it. Had I not by this, and another passage in the letter, been made to think about it, and had it not been that while all the rest had faded absolutely, one solitary incident at the hotel in Kidderminster was recalled by effort, I should have asserted quite positively that no such expedition as this ever took place.

CHAPTER XX.

AN INTERVAL IN TOWN.

1845. ÆT. 24—5.

PRIVATE bills, or at least all of those asking for authority to interfere with lands, houses, roads, or other possessions, public or private, have (or then had) to pass through a preliminary stage, which is known as examination by Committee on Standing Orders. Justice obviously requires that all whose properties will certainly, or probably, or even possibly, be interfered with in the execution of the proposed works, shall be duly informed of the impending interferences; so that they may be prepared for opposing, if need be, the desired authorization. It is, therefore, directed that detailed plans and sections, showing what is to be done, shall be deposited in the localities affected (and afterwards the relevant parts of the plans, &c., in each parish), a considerable time before the meeting of Parliament; and that there shall also be made accessible, certain "books of reference," by which the plans, &c., may be interpreted. Of course these requirements may be adequately or inadequately fulfilled; and it is the function of the Standing Orders Committee to go carefully through the plans, &c., to see whether they sufficiently meet the requirements: usually being guided in their judgments by the criticisms of experts, employed by opponents to detect errors and shortcomings. Always some imperfections exist, and are most of them discovered; and the Committee has to decide whether these imperfections are or are not so serious as to invalidate the application.

In the days of which I write, the new Houses of Parliament were in course of erection. The part eventually provided for committee-rooms had not been built, and there ran along the Thames-side a temporary wooden structure, divided into the many apartments at that time required for those who dealt with the many railway-bills brought before Parliament. A long corridor, carpeted with cocoa-nut matting to diminish noise, flanked these chambers of inquisition; and, during the day up to 4 o'clock, this corridor served as a promenade for various of those who were concerned in the schemes before one or other committee, or about shortly to be brought before one. Here, along with coadjutors, there were daily to be met old engineering friends; and the talk, now grave, now gay, broken from time to time by visits into the committee rooms to see how this or that inquiry was progressing, filled a life which for a short time was pleasant enough, but which eventually came to be rather wearisome. Hence the following extract from a letter written home on 25 April:—

"Yesterday we passed safely through the Standing Orders Committee, and, greatly to our satisfaction, put an end to our sauntering-in-parliamentary-lobbies-life, which has now lasted for about ten days.

"Mr. Hughes left for Pembroke last night, where he will remain until the 5th May, when we are to go into committee 'on the merits,' as it is technically called. I have to make sundry preparations, such as getting out the rest of the bridge drawings, &c., &c., which will fully occupy the intervening time. . . .

"I think of going down to Blackwall this evening to see the 'Great Britain' steamer. I hear that it is well worth a visit in a professional point of view."

There is also in this letter a brief reference to such small amount of social intercourse as I then had; but of this, more presently.

The weariness of this waiting was compensated by London distractions, of which I now took a fair share. During my residence in Town when 17, I never went to a

place of amusement; but now that I had more means I yielded to the appetite for theatricals. The following letter to Lott, dated 7 May, contains passages expressing opinions about some kinds of them:—

"Hutton [an elder brother of R. H. Hutton] and I went together to the Opera. I was dreadfully disappointed. I was not roused to an emotion of anything like enthusiasm during the whole time. The inconsistencies of recitative dialogue, the singing words of wholly opposite meanings to the same harmony, &c., &c., so continually annoyed me as to destroy all the pleasure due to the music or the story. Neither was the effect of the music so great as I had anticipated. It did not *fulfil its ambition*, if you understand what that means. The effects of its several parts were not powerful enough to render them fit portions of so large a composition. The structure wanted a massiveness more in proportion to its size. As it was, it gave me the idea of rickettiness.

"However, I am going to give the thing another trial. The Opera I heard was 'Sonnambula,' and some of the first singers were absent, so that I did not hear the greatest effects. To-morrow night Hutton and I are going to hear 'Don Giovanni.'"

The result of this second trial was much like that of the first. It seemed to me that a series of pretty airs and duets did not constitute an opera, as rightly conceived. Then, as always, I was intolerant of gross breaches of probability. Though able to listen without too obtrusive a sense of incongruity to the melodic renderings of their feelings by hero and heroine, since song is natural to high emotion, yet I could not help making internal protests against the extension of musical utterance to other characters in the drama, who were not similarly moved. That serving-men and waiting-maids should be made poetical, and prompted to speak in *recitative*, because their masters and mistresses happened to be in love, was too conspicuous an absurdity; and the consciousness of this absurdity went far towards destroying what pleasure I might otherwise have derived from the work. It is with music as with painting—a great divergence from naturalness in any part, so distracts my attention from the meaning or intention of the whole, as almost to cancel gratification.

There is in the same letter mention of Haydn's *Creation*, and of the pleasure I derived from hearing it. In the absence of attempted dramatic rendering, attention could, when listening to this, be given more fully to the music; and any incongruities felt were far less pronounced.

Following the order of dates, I am led here to quote a letter relevant to a very different matter—the ending of a friendship. Up to this time there had been kept up the correspondence with E. A. B——; and, now that I had come to London, he spent an evening with me at 64, Stafford Place, Pimlico, where I was lodging. Our conversation ended in a theological discussion, in which my rationalistic views, then more pronounced than at the time of our previous personal intercourse, were clearly disclosed. There resulted a letter from him dated May 6, 1845:—

"MY DEAR SPENCER,

"It is now fast drawing towards the close of the fifth year since I made your acquaintance, and I hope I need not assure you that your friendship during that period has been one of my chief sources of pleasure. From the time when accident threw us together at Worcester, and from circumstances we were so intimately associated, I have always felt the strongest feelings of regard towards you and was pleased to think those feelings mutual.

"I merely remind you of this to show you that it could be no ordinary cause which could induce me to renounce voluntarily a friendship which has afforded me so very much gratification as yours has done; that the necessity has accrued for so doing I shall ever most deeply regret and it is only after long and painful thought that I have been induced to see the necessity of it.

"That we have held different opinions upon many points of more or less importance, I am perfectly aware; but as far as I can call to mind, they have been always upon points upon which such difference has been to a very considerable extent allowable, or upon subjects which are, and must remain, matters of opinion. But the subjects which we discussed last Saturday (as far as I can recollect for the first time) do not I think belong to either of these classes. They involve everything in our existence of more than momentary interest; our principles and practice, hopes and fears, our happiness or misery here and hereafter. Such matters are of no light moment, and it seems to me that

no two persons holding so very different views as you and I do upon such vital points can remain friends to each other. Did I think that there were the remotest chance of anything that I could urge by way of argument or persuasion I should feel that I was bound to leave no means untried to endeavour to bring you to a true view of the truths of religion, but I know so well that no *argument* on such a subject ever yet convinced one who has closed his ears to everything but *human reason*, that I feel it would be utterly useless; and the only likely consequence that could ensue would be to shake the belief that I feel so very strongly the truth of. I would to God that I practised all I believe so thoroughly, as far as intellectual belief may go; but which avails absolutely nothing, if it be not accompanied by the belief of the heart. Feeling, as I do, so very painfully that my faith is so little the heartfelt faith which should actuate the true Christian, the danger which might accrue from my association with one so talented as yourself, and so well able to make the worst appear the better reason, I must therefore at however great a sacrifice (and believe me I feel it to be a great one) renounce the pleasure I have received from your acquaintance and request that henceforth we meet no more or meet as strangers. I shall ever remember the past with pleasure and think of you with kindness and I trust that nothing may prevent your feeling similarly towards myself."

Then follows the expression of a hope that I shall abandon "the lamp of human wisdom" and come round to wiser views. This letter I sent on to Lott; saying that "there was much to be admired in its sincerity" if not in its liberality. Lott's rejoinder was that did he similarly feel any such danger from our association, he, too, should renounce the friendship.

A subsequent letter from E. A. B——, in answer to one of mine, agreed that though our intimacy must cease, there was no reason why, when we met, we should not meet as old friends. Thereafter no intercourse between us took place for years. Though two of his sisters when visiting Derby (where a younger brother had settled as an agricultural chemist) expressed the wish that friendly relations should be resumed, I declined taking any step until their brother gave the sign. In 1851, soon after the publication of my first book, I did indeed spend an evening with his father and family, and again met him in quite a friendly

way; but since that time, save when meeting in the street once or twice, we have never seen one another.

While one friend was lost, others were gained. During those days in April and May, the acquaintanceship with Mr. and Mrs. Potter, which had been initiated while I was visiting Mr. Heyworth at Liverpool, began to develop into a friendship. The already quoted letter of 25 April, speaks of spending an evening with them; and a letter of 25 May contains the paragraph:—

"On Thursday morning I breakfasted with my uncle at the Potters' in company with Mr. Heyworth. Mr. Potter behaved very kindly. I dined there twice during the visit of my uncle and aunt, and should also have spent last Tuesday evening there with my uncle had I been disengaged. Mr. Heyworth, too, was very cordial in his desire that I should come to see him at Yew Tree whenever I had an opportunity."

A passage in a letter from my uncle to my father, dated two days later, referring to this same meeting at Mr. Potter's, says of me:—

"He was also at the complete suffrage meeting at the Crown and Anchor on Wednesday evening. Mr. Potter told me that he had requested him to make a short speech at a Temperance Hall to which he took him, but that Herbert declined. I think it would be much for Herbert's own benefit if he were to commence in a quiet way the practice of public-speaking."

What other social intercourse I had at that time, did not go beyond evenings spent, and occasional excursions made, with old engineering friends. Writing to Lott some two months later, I said:—

"You have no notion how miserably off I am here for society—more especially female society. It is now at least two months since I have come in contact with any well educated and agreeable woman; for, unluckily, Mr. Potter and his wife and sister have latterly been out of town and I have been deprived of the only society that I prize. . .

"For want of other resource, Loch (whom you have seen) and I have very frequently spent the evening together in argument, which we have upon several occasions prolonged until one in the morning."

This last statement surprises me; for though in early days an animated talker, and when with a chosen com-

panion able to go on for hours, I did not remember talking till past midnight. The *besoin de parler*, requiring to be satisfied irrespective of the person and the topic, never existed in me; and for these many years I have felt no inclination for continued conversation. Still greater is the change in a further respect. That I should be able to sleep after arguing till late into the night, seems to me now almost incredible.

Reverting to the business course of my life, there has here to be quoted, from a letter to my mother dated May 24th, a passage foreshadowing an entire change of prospects.

"Our Railway Bill was withdrawn on Tuesday last in favour of the London and Birmingham scheme, so that my engagement is concluded. There is, however, no cause for regret, as you will readily acknowledge when I tell you that yesterday, as I was sauntering about the Committee-room lobbies, I met Mr. Fox . . . and after accompanying him for about half an hour during his meetings with various people, I walked with him arm-in-arm to his offices in Trafalgar Square. During our walk he was very communicative with regard to their affairs, and behaved altogether in a very friendly manner."*

And then, on the 5th June, there was sent to my father a statement of definite results.

"I have satisfactorily concluded my engagement with Mr. Fox. My occupation will be a very agreeable one. I am to collect information with regard to the particulars of all works for which the firm propose to tender—to inspect the designs according to which the work is to be executed, where such have been made, and to obtain all necessary information with regard to them—and where there have been no designs made, to obtain from the parties a definite understanding as to the requirements of the case, and then to superintend the getting out of designs."

* Here it must be explained that soon after I left Mr. Fox in 1837, he gave up his post as resident engineer of the London and Birmingham Railway (London half) and entered into partnership with Mr. Bramah (either the inventor of the hydraulic press or his son, I don't know which), at that time carrying on extensive mechanical engineering works. The new firm, Bramah and Fox, extended its operations to works of other kinds. Bramah shortly afterwards ceased to be a member of the firm, and at the time above spoken of it had become Fox, Henderson, & Co.

This engagement appeared advantageous and promised permanence. Further passages imply another pleasurable anticipation—frequent exercise of the inventive faculty, which the post was likely to call for.

Again I interrupt the narrative to show, so far as may be, the nature of my thoughts in those days; and also to show the small regard for authority, displayed then as always. In a letter to Lott, already above quoted from, there occurs the passage:—

"I have been reading some of Carlyle's essays. They are very beautifully written and as usual with all his writing, interestingly also. They do not however give the same impression of genius as his other works. In some cases I thought him by no means deep. Some of his quotations from the prose writings of Goethe, were in my estimation not at all creditable either to the author or the critic. I fancy I see you curling your lip at these cavalier remarks on your hero!"

My impression is that this disrespectful estimate referred to the doctrine of renunciation, set forth by Goethe in his account of "The Renunciants," and applauded by Carlyle; and probably I then thought, as I think still, that it implies anything but a profound conception of human nature—a conception like many of those current among the uncultured, who assume that the emotions can be produced or suppressed at will. The entire mechanism of animate life, brute and human, would be dislocated if the desires which prompt actions were governable in this easy way. The common idea, as well as the Goethe-Carlyle idea, is that the feelings constitute an assembly under the autocratic control of "the will"; whereas they constitute an assembly over which there reigns no established autocrat, but of which now one member and now another gets possession of the presidential chair (then temporarily acquiring the title of "the will") and rules the rest for a time: being frequently, if not strong, ejected by combinations of others, and occasionally, if strong, effectually resisting their efforts. It is in these last cases that the

forcible deposition of the tyrant emotion is proposed. When the feeling overwhelms all others, we are told that it should be put down; and the putting down of it becomes practicable only in proportion as it becomes needless. Tell a mother who has just lost a child, or a lover whose to-morrow's bride has been drowned, that grief must be suppressed in conformity with the doctrine that pleasures are not to be counted upon, and that she or he must accept a lower standard of happiness. What result is there? None whatever. While sorrow is extreme, consciousness is entirely occupied by it. No alien thought or feeling can gain entrance. Until its intensity has caused exhaustion, and a relative inability to feel, the desirableness of resignation cannot even be listened to, and when it can be listened to the effect is evanescent: recovery from the temporary paralysis of emotion is followed by another paroxysm, during which the propriety of doing without the lost happiness is urged on deaf ears. Only in course of time, when the natural curative process has in chief measure wrought its effect, and the feelings have readjusted themselves to the new conditions—that is, only after "renunciation" has been in large measure spontaneously effected,—can the doctrine of renunciation be listened to, and give form to the new mental state reached. The truth is that in mankind, as in all other kinds, each faculty, bodily or mental, has a normal craving for action. Where the faculty is not a powerful one, and the normal craving is relatively weak, it may be kept out of consciousness. But where it is a strong craving of an important faculty, exclusion of it becomes almost or quite impossible. A bodily appetite, like that of hunger or thirst, furnishes the best test of the doctrine. No one dreams of saying to a starving man that he must get rid of the misery due to his unsatisfied desire by renouncing the gratification of eating, or that, when exposed to a freezing cold with but little clothing on, he must make himself content by ceasing

to wish for warmth. And the absurdity, here rendered manifest because the feelings in question are so strong, holds throughout the whole nature.

But this doctrine of Goethe jumped with Carlyle's anti-utilitarianism, and with his ridiculous notion that happiness is of no consequence. This notion would have been considerably modified by passing some months in a dark dungeon on bread and water. Or if, after such an experience, he had still refused to admit that gratifications of various kinds ought to be pursued, his body, at any rate, would have testified that they ought.

This parenthetical discussion may not unfitly be taken to symbolize the parenthesis in my career which here occurred. Incidents named a page or two back, apparently implied that I was about to be settled for a considerable period. The settlement lasted for but a short time, however, as witness the following extract from a letter to Lott dated 1 August, 1845:—

"You have probably heard at 8, Wilmot St. that I have left Fox, Henderson, & Co. and that I did so in consequence of the attempt to put upon me work which I had not agreed to do, and the command to do which I paid no attention to (like my democratic spirit was it not?) whereupon a quarrel ensued which ended in our separation.

"My future movements are just at present undecided. Very probably I shall be engaged upon a line in Holland from Amsterdam to the Helder, of which my friend Jackson is to be engineer, and if this scheme misses fire I shall probably retain my present engagement in connexion with the projected Crewe and Aberyst with Line. Probably a fortnight will decide the matter one way or other."

This line between Aberystwith and Crewe had been projected by one whose name the reader may remember as occurring a few chapters back—Mr. W. B. Prichard. No impression remains with me of anything done in connexion with it. Certainly I did not join the survey party, of which my friend Loch was one. For some reason, the scheme dropped through comparatively early in the season: whether because the engineering difficulties were great,

or because the local landowners, not yet so much alive as the English landowners had become to the benefits of railways, gave it no countenance, I cannot tell. But, as we shall presently see, Mr. Prichard had more strings than one to his bow.

CHAPTER XXI.

ANOTHER PARLIAMENTARY SURVEY.

1845—46. ÆT. 25—26.

THE rise of the railway-mania dates back, I think, to the autumn of 1844, after the profitableness of railway-investments, and the advantages of railway-communications, had been, for several years, growing conspicuous. Dividends on some of the leading lines, such as the London and Birmingham, had risen to as much as 10 per cent., and £100 shares stood at £234. In earlier days landowners had been strenuous opponents of those "new fangled" highways, which got Act-of-Parliament authority for cutting up their fields and interfering with their privacy. But ten years' teaching had changed their ideas, and made them anxious to profit by that raised value of land which railway-proximity gave. Some towns, too, (such as Nottingham, which successfully resisted establishment of the central Midland Station in its suburbs), had seen the error of their ways, and became eager for that which they had previously rejected. Meanwhile, there had been yearly increasing the classes of contractors, engineers, and lawyers, professionally interested in railway-enterprise, and ready to co-operate in getting up new schemes.

There had, indeed, commenced inversions of the original relations between those who supplied money for making railways and those who made them—inversions which by and by became common. During the thirties, speculative local magnates and far-seeing capitalists, having projected

railways which would obviously be advantageous, thereupon chose their engineers, and subsequently let portions of their works to contractors; but, as fast as there grew up considerable classes of wealthy contractors, and of rich engineers accustomed to co-operate with them, it became the habit for these to join in getting up schemes, forming companies, and practically appointing boards—a policy in all ways beneficial to themselves. Thus, by 1845, there had arisen many and various interests uniting to urge on railway-enterprise; and any one who took a broad view of the causes in operation, might have seen that great disasters were certain to ensue.

Naturally with a public having excited imaginations of profit, stimulated by men who had large spoils in prospect, it became easy to "float" multitudinous schemes—bad almost as readily as good. It needed but to take a map of Great Britain, and look out for a comparatively blank space where there were towns of some size; run a pencil-mark through a string of them; gather together some known local names, headed, if possible, by one with a title; issue flaming advertisements; and people rushed in to take shares. Mr. W. B. Prichard was one who seized the opportunity; and, having no lack of self-confidence, and abundant energy, readily achieved a certain success. His first venture, as already intimated, collapsed; but a second, in the prosecution of which I was employed by him, lived through sundry of the early stages. His proposed line, commencing at Northampton, ran through Weedon, Daventry, Southam, Leamington, Warwick, Stratford-on-Avon, and by Alcester to Worcester. As compared with those of many projects which at that time found favour, the mercantile prospects of this were not unpromising. Though the cross-country traffic from end to end might not have been considerable, yet, from the numerous places brought into connexion with the great trunk lines, a good deal of business might have come. A

City-firm of lawyers, young and without established name, joined Mr. Prichard in this second venture; and having obtained, as their chairman and chief decoy-duck, Sir John De Beauvoir, they enlisted some notables from the towns to be advantaged, formed a board, and issued a sufficiently attractive prospectus.

Pleasant recollections come back to me on thinking of the latter half of August, the whole of September, and the first half of October, during which the initiation of this scheme, and first stages of its progress, took place. To begin with, there was a drive with Mr. Prichard from Weedon to Warwick, to inspect the line of country to be followed. Then came a meeting of promoters, held at the chief hotel in Northampton, to which I was sent by Mr. Prichard as his representative: he being otherwise engaged. The successful issue of this meeting was followed by a drive with a party of the proposed directors, repeating the one taken shortly before. During this drive I was occasionally cross-questioned respecting the required works and the time to be taken over them; and, meanwhile, had an opportunity of judging those whose names either were, or were about to be, put before the public as sponsors. Neither intellectually nor morally did they commend themselves to me. In some, the eager grasping at pecuniary advantage was very conspicuous; and one I more especially remember—a London barrister —left on me an impression of greed such as we hear of in those round a Monte Carlo gambling table. The excursion itself, however, was pleasant enough; and it was not altogether unpleasant to be appealed to as an engineering authority: feeling, though I did, that my answers had intrinsically by no means the weight ascribed to them, but feeling, also, that they had perhaps as much weight as those of their engineer-in-chief. Not long subsequently came the gathering at Northampton of the staff of sur-

veyors, and the apportioning of their various divisions to them. My own business immediately thereafter was that of making a trial-section of the proposed line.

Of the various sub-occupations into which the general occupation of a civil engineer is divisible, that of levelling is perhaps the most agreeable—at any rate in fine weather. As compared with surveying, it has the advantage that the strain on the attention is much less. During the carrying of the level from each station to the next by an attendant, there is a brief walk of one or two hundred yards or more; and the surrounding pretty scenery, if there be any, may be enjoyed. Adjustment of the level, a purely mechanical process made easy by practice, is quickly effected; the attendants, carrying the two staves, are soon made to perform properly their respective parts, if they are tolerably intelligent; and then the two observations—"back-sight" and "fore-sight" as they are called—severally taking but a few seconds, require nothing more than accuracy of perception and care in rightly putting down the results in the level-book. I see by a passage in a letter to my father, dated Leamington, 12 October, that practice had rendered me tolerably efficient.

"I sometimes level upwards of 5 miles in a day, and my levels have always proved *within a foot* in distances of 15 to 20 miles. In the last section I finished, the error was 0·35 of a foot in 15 miles, or about 4 inches."

The day's out-door work, beginning with a drive to the ground after breakfast, and ending with a drive back, or onward to the next stopping place, early in the evening, has but a small in-door addition. After a dinner made enjoyable by the moderate exercise continued through the day, there remains only half-an-hour's attention to what is called "reducing" the levels—preparing the observations taken for graphic representation on paper, as a section. The rest of the evening is available for chat with a companion leveller, if there be one—made especially pleasant if he be a friend, as happened in this case. The

fine autumn of 1845 yielded me in these ways many gratifications.

It was not in my nature to follow the beaten track in this out-of-door engineering work, any more than other work. Everywhere there is opportunity for improvement, manifest enough to those whose field of view is not narrowed by custom. It was so here.

In the course of preceding months—probably during my experience of the previous autumn—I had become dissatisfied with the ordinary mode of dividing levelling staves. It failed to meet sundry *desiderata*. The result was that before leaving town, I had busied myself in making two sets of papers divided after a new mode, to be fastened (glued and varnished over) by the maker on to the staves I was buying, in place of the ordinary papers: being obliged by shortness of time to sit up the greater part of one night to complete them. Explanations and drawings will be found in Appendix G.

Successful innovation of this kind soon led to one of another kind. Dissatisfaction with the ordinary process of "plotting" sections, prompted a little appliance for economizing labour and insuring greater accuracy. While in the country I could not utilize my plan; but, judging by the date of their bill, must have sent drawings to Messrs. Troughton and Simms with an order to make the instrument for me, and, during subsequent stages of the work in town, used it with advantage. Details are given in Appendix G.

With these small inventions which were put to use, may be joined the project of a more ambitious one which was not put to use. A solitary evening at the hotel in Stratford-on-Avon, was spent in thinking over certain defects in the ordinary type of "dumpy level," and in making sketches of an arrangement by which they might be avoided. When, subsequently, occasion favoured, I laid

my plans first before one optician and then before another; but neither of them would agree to make a level of the proposed kind at his own risk, and, as the cost would have been probably some £20, I did not like to undertake the risk myself. The advantages of the design were sufficiently obvious; but the opticians I negotiated with had adverse interests which I did not at that time recognize, but which were, many years later, revealed to me in connexion with another invention. When a trader has a large stock of anything, it often does not answer his purpose to introduce an improved thing, which will discredit his stock and diminish its value.

Occasionally, during recent years, I have been prompted to get one of these improved levels made: being no longer deterred by the thought of cost. But continually decreasing energies, and the need for avoiding distractions, have prevented me. In Appendix G are contained sketches sufficient to make the plan comprehensible.

During those autumn months the railway-mania had gone on rising, and had spread into all classes. Even my father, not a man of business and living wholly outside the current of commercial affairs, had been, by a mercantile friend in Derby, induced to join in the general rush. A local project had been recommended to him, and, in response to his application, shares had been allotted. I heard of this step with disapproval, if not indeed with dismay, as witness the following extract from a letter dated 6 October:—

"I was, I assure you, by no means glad to hear that you had been meddling in this kind of speculation, which I think is exceedingly objectionable in several respects. I have wholly refrained from it myself, though I have no doubt, from my acquaintance with directors, I might have had shares allotted to me in the undertakings with which I am connected. I have refrained for two reasons; one because I have no faith in the *bonâ fide* character of the schemes now afloat, inasmuch as the majority of them are started merely for the purpose of creating shares to speculate in, and I do not think it altogether the thing to buy

shares with no ultimate intention of keeping them, and only for the purpose of profiting by the premium to which they are expected to rise. My second reason for refraining from such speculation, is that I consider the share-market in so exceedingly unstable a state, in consequence of the circumstances to which I have alluded, that I believe it to be imminently dangerous to have anything to do with it. I am fully convinced that some panic will very shortly arise, the advent of which may be wholly unexpected and apparently causeless, and I would therefore *strongly advise you* to put yourself in a safe position by selling out *at once*. I assure you I shall be very fidgety until I hear that you have done so, for I should say, from what I know of the railway-accommodation of the district through which the Derby and Gainsborough line will pass, that it is one of the bubble-schemes to which I have been alluding and will never be carried out."

To my father's reply, not discoverable among my papers, the following response was sent:—

"If you do not feel inclined to sell all your shares at once, which I still strongly recommend, by all means sell half, as you propose. I assure you that none of these schemes can be considered safe. I do not speak without good grounds, for I have come in contact with many of the directors and promoters of them, and I know most certainly from their conversation, that their great, and I may say only, object, is to get their shares to a good premium and then sell out. So long as this is the general intent there is no knowing how soon the smash may come, for on the least alarm all will be wanting to sell and the shares will be at a discount."

Then, in an undated letter, which, however, appears to have been written some days before the 20th, I wrote:—

"Very numerous orders are arriving in London from the country to sell railway-shares. This may very possibly lead to a panic, and if so your shares will go down to a discount. I think you had better sell out at once by all means."

And on the 21st I expressed my satisfaction that he had promptly acted on this advice, and, as it appears, only just in time, for already the panic was beginning.

Referring to the feeling expressed in the first of the foregoing letters, I may properly remark that not only then, but ever since, I have acted upon the principle indicated. It is now nearly 50 years since the letter was written, and never, during the interval, have I bought shares or bonds save as permanent investments.

Often, during this interval, I have debated with myself the question whether any legislative restriction on the traffic in shares would be useful, and whether it would fall within those limits of State-functions which I have so strenuously insisted upon. It has sometimes seemed to me that since, for the administration of justice, contracts which are to be adjudicated upon are tacitly understood to be *bonâ fide* contracts, such that the property in question is actually, and not apparently, bought, it might not be improper if the law should refuse to recognize transactions in which the forms of buying and selling are gone through without any intention of taking real possession. Certainly the permission to allow nominal purchases to pass as though they were real purchases, leads to very great mischiefs, and even to something like national disasters. But I have never been able to decide whether the implied check on transactions in shares would be theoretically legitimate or practically beneficial.

There now came a sudden change of scene, from the fields and fresh air of Warwickshire and neighbouring counties, to the streets and smoke of London. The occasion for this change is shown by the following letter:—

27, Wilmington Square, Oct. 16th, 1845.

Dear Sir,—You are to take charge of my office after this day—and for such you are to receive £4 0*s.* 0*d.* per day (no expenses) or £24 per week until 30th of November next from this day. After that date I will make fresh arrangements.

I am yours, WILLIAM B. PRICHARD.

A statement of my new duties, somewhat more specific than is here given, is contained in a letter to my friend Lott, written on the 30th of the month.

"I suppose you have heard it rumoured in Wilmot Street that another temporary change has come over the spirit of my variable dream of existence. I have given up my field work for a more lucrative post which has been made over to me (in the same concern); the said post being that of general superintendent of the parties employed in getting up the plans of the several lines of railway of which

Prichard is engineer. At present I have the plans of four lines to look after, and expect shortly to have those of another begin to come in. As you may imagine, therefore, I am considerably busy, and expect to work at a gradually increasing pressure until the end of November."

Either of his own motion or at the instigation of those with whom he had connected himself, Mr. Prichard had undertaken, in addition to the scheme described above, sundry others more or less wild, to which I should now have had no clue but for the lithographed titles of them on letters dated from the office, 27 Wilmington Square. One was the "Erewash Valley Extension, Rochdale, Blackburn, and East Lancashire Railway Company." Another was entitled "Great Western, Southern, and Eastern Counties, or Ipswich and Southampton Railway Company." I remember too, though there is no headed letter giving its name, that there was a line from Grantham to somewhere, to which Mr. Prichard was to be "consulting" [!] engineer. The course of things during November will be sufficiently indicated by the following letter written home on December 2nd:—

"With great exertion we made our deposits on Sunday, and heartily glad I was that the termination of our labours had arrived, for I had never before experienced so anxious a week as the last. I was at work until 12 and 1 during the early part of the week; on Wednesday I did not go home until after 4 o'clock; and from that time until Sunday night I never went to bed at all. These arduous duties have, I am happy to say, had very little injurious effect upon me. On Monday I felt nothing unusual but a little languor, and to-day I am just as usual.

"I have, I believe, given great satisfaction by the efficient manner in which I have managed the work deputed to me. Sir John de Beauvoir, the Chairman of the Board of Directors, has authorized Mr. Prichard to pay me £20 in addition to my salary, in consideration of the value of the services I have rendered; and my name is further to be mentioned to the Board. . . .

"Towards the last, Prichard referred more and more to me, and in almost all cases acted upon my judgment; and, when he acted contrary to my advice as to the number of plans to be deposited [*i.e.*, schemes to be persevered with], he was ultimately obliged, at the eleventh hour, to relinquish his intention, and in doing so lost all his courage and put everything into my hands.

"You may judge of the complication of the affairs I have had to

manage, when I tell you that during the last week I had about twenty assistants, and that I had to look after the getting up of the plans for the following lines :—

London and Birmingham Extension	31	miles.
Deviation Line to ditto	13	„
Small branch of ditto....	1	„
Fenny Compton Branch	9	„
Rugby Branch....	3	„
Warwick and Birmingham Canal Railway [canal turned into railway]	20	„
Hampton Branch to ditto	3	„
Warwick and Worcester Railway	28	„
Droitwich Branch to ditto	8	„
Ipswich and Southampton Railway [only partly carried out]	36	„
Total	152	„

"I think it probable that Prichard will ensure the continuance of my services by offering me advantageous terms, and in such case I shall most likely remain with him to conduct the Bill through Parliament."

In the days of which I am writing, envelopes had not come into general use, and the long-standing practice, which then survived, of so folding the sheet containing a letter that the address occupied a fold of its outer surface, had the advantage that the post-mark (when legible) fixed the date. Hence it happens that in many cases the outsides of letters show me when they were written, though the insides do not. In this way I learn that some ten days in London after deposit of plans having been occupied in business, I spent a few days at home: returning to town on the 14th December.

Poor Prichard had been intoxicated by his success in floating schemes: neither recognizing the fact that under the conditions which led to the mania anything might be floated, nor recognizing the fact that success in getting companies formed by no means implied success in carrying out their proposals, even to the extent of completing and depositing plans. As he has been dead these 40

years, and has left no descendants, I need not hesitate in saying that his course was like that of the fabled monkey, which, putting its hand into a jar of fruit, grasped so large a quantity that it could not get its hand out again. Had he been content with a single scheme he might have succeeded, but he seized more than he could go through with and defeated himself.

At what date, and concerning what matter, difficulties began to arise between him and the directors of the Northampton, Daventry, Leamington and Warwick Railway, I do not know; but early in December it became manifest that the board had lost confidence in him. This is indirectly implied by the first paragraph of a letter sent to me by the Secretary on the 13th.

"I am desired by the Board to request, that you will attend a deputation which will proceed to Daventry to attend a meeting appointed to be held there on Thursday morning at 10 o'clock."

A letter to my father, written on the 17th, shows what course I took.

"I have just been with the Directors and am treated by them with great respect. They wished me to attend this meeting at Daventry as well as Prichard, but, as I explained to them that I expected this would offend him, they agreed only to require my presence in case of his absence."

Probably he was not absent, for I do not remember attending the meeting. Though there is no written evidence verifying it, my impression is that the breach which was evidently beginning gradually widened; and, in fact, could scarcely do otherwise, since his failure to achieve much that he had undertaken could not be concealed, and of course caused profound dissatisfaction.

What happened during the next few months memory fails to tell me, and letters yield small means of supplying the place of it. Of course some needful business was being done, but the only trace of it is the mention to my father of an expedition to Warwick and Stratford, taking

with me two draughtsmen, to examine, or make tracings of, certain deposited plans.

During the high-pressure days of the autumn, such small social life as I had was suspended. An undated letter to my father, which I infer was written about Christmas, contains the paragraph:—

"I dined yesterday evening with my friends the Potters, and I am to dine there again to-morrow. They told me that Mr. Heyworth had a very interesting account of our travellers in the United States. My uncle did not seem to have so much confidence in the American people as formerly. They have seen Emerson and do not like him at all. I am not altogether surprised at this information, for it seems to me that my uncle has not a sufficiently liberal spirit to understand all the kinds of great men."

In explanation of this passage it is needful to say that, in the preceding summer, there had been planned an excursion to America, by my uncle and aunt and Mr. and Mrs. Potter, taking with them one of Mr. Heyworth's sons, James. Eventually it was decided that Mrs. Potter was not strong enough to go; and the party dwindled down to three. During the tour my uncle gave numerous lectures—most of them, I suppose, temperance-lectures, but some of them anti-slavery lectures, which at that time it required some courage to deliver. His lowered estimate of the Americans may have been in part due to the unfavourable reception these lectures met with. That he should have been pleased with Emerson is out of the question; for his intellect dealt with things in the concrete almost exclusively, and even broad philosophical views, still more mystical views uttered in detached aphorisms (Emerson confessed that he could not make his ideas stick together), were foreign to his mind.

One other reference to social life is made. An evening in the middle of January was spent at the house of Mr. (afterwards Dr.) Chapman, of whom more hereafter. William Howitt and his wife, at that time well-known as popular authors, are named as of the party; and he is

described as a little robust man with a big head, which had struck me as remarkable before I knew who he was. The only further thing I remember about him was his remark that Keats would have been a greater poet than Shelley had he lived—a belief in which I suspect he was right.

Probably this remark was called forth by some laudation of Shelley uttered by me, for I still greatly admired him, as was shown soon after by a letter to Lott, in which I rejoiced that he was at length reading "Prometheus Unbound," my especial favourite. This same letter contains a passage worth quoting, as being characteristic of my tastes, both then and afterwards:—

"I have seen nothing more of Carlyle's *Cromwell* than is to be gathered from the reviews. As you correctly surmise, I have no intention of wading through it. If, after a thorough examination of the subject, Carlyle tells us that Cromwell was a sincere man, I reply that I am heartily glad to hear it, and that I am content to take his word for it; not thinking it worth while to investigate all the evidence which has led him to that conclusion. I find so many things to think about in this world of ours, that I cannot afford to spend a week in estimating the character of a man who lived two centuries ago."

Concerning my reading in those days I will add one other paragraph, which in a measure emphasizes the foregoing, by implying interests of an entirely unlike kind.

"I have read a criticism on the work entitled 'Kosmos' in *The Westminster Review*, and I am going to read it when there is a new edition, which is to be published in two or three weeks. Judging by the quotations it seems to me that Baron Humboldt has a leaning to the 'development theory.'"

This last remark implies that as far back as 1845, the general idea of organic evolution, espoused five years before, had become a subject of interest to me.

Some of the foregoing passages are from letters written to my father in French. That repugnance to language-learning which, at Hinton, led to final abandonment of the attempts to teach me Latin and Greek, was shown in the learning, or rather non-learning, of this language also. I obtained at that time nothing more than a very

imperfect acquaintance with the first parts of the grammar, joined with a few sentences from a phrase-book. Memory unaided would have led me to say that this very rudimentary knowledge was not added to until the spring of 1844; but among my papers I find the bill of a French teacher in Derby, showing that, when 21, I took half-a-year's lessons, one per week; and then, during my stay in town while the Worcester and Wolverhampton bill was before Parliament, I submitted myself to the Hamiltonian system for a short time: having, as the charge shows, a dozen lessons. My constitutional idleness, joined with a special impatience of rote-learning, prevented persistence; and, in default of regular lessons, my teacher recommended easy French novels, to be stumbled through somehow. His advice was followed, and my further acquaintance with French was gained by a process of scrambling—reading some sentences and skipping those I could not make out: caring only to follow, as well as might be, the drift of the story. At the date of the foregoing letters I had recommenced these intermittent efforts: being prompted to do so by the intention of going to Paris as soon as disengagement permitted. A further measure was taken. There had at that time been established in the Strand a French reading-room, to which I occasionally betook myself to look through the French papers; and at my request the *directrice* agreed to find some Frenchman with whom I might arrange to speak French while he spoke English; but nothing came of the suggestion, and my studies soon ceased again. No grammatical knowledge of the language was ever acquired. As to the genders, I never even tried to remember them.

While a few of the letters utilized in this chapter are written in French, a larger number of them are written in my father's shorthand. Correspondence had been carried on in it in 1843, during my sojourn in London, and had, from that time onwards, been irregularly continued when

I was long away from home: the final cessation, which presently occurred, resulting from my mother's protest against a practice which debarred her from learning news of me when my father was out. Of the letters thus written during the latter months of 1845, two contain passages concerning the shorthand itself. The first is:—

"I have been making some enquiries about the price of glyphographing your shorthand and find that it would cost about £1 per page. I think it will be best to adopt lithography done neatly."

And then, in a subsequent letter, there is a proposal which I had forgotten.

"I am getting very anxious that you should get your shorthand published, and if you will agree not to flinch in transacting the business part of the matter, I shall be happy to defray the expenses myself."

But nothing came of this offer. At that time, as throughout subsequent years, my father's tendency to postpone decisions of importance prevented anything from being done.

One other incident dating back to this period must be added. My interest in phrenology still continued; and thought, occasionally expended upon it, raised dissatisfaction with the ordinary mode of collecting data. Examinations of heads carried on merely by simple inspection and tactual exploration seemed to me extremely unsatisfactory. The outcome of my dissatisfaction was the devising of a method for obtaining, by graphic delineations, mechanically made, exact measurements, instead of the inexact ones obtained through the unaided senses. A description and drawings of the appliance I devised to this end will be found in Appendix H.

I return now to business matters. The first fact to be named is that a letter posted on March 22nd, 1846, says:—

"We expect to go before Committee on Standing Orders this week with the London and Birmingham Extension. With the Warwick and Worcester we shall probably have another week's waiting."

Considering that success or failure in obtaining our Act was likely to determine the course of my life for some time, it is strange that the process of examination before Standing Orders Committee has left no recollections. The outcome, however, is clear. The plans did not pass the required tests, and no further stage could be entered upon. I knew that this result was tolerably certain, and wrote home to that effect. The over-pressure on all classes concerned in preparing for Parliament the multitudinous schemes brought out during the mania, unavoidably entailed imperfections unusual in numbers and degrees. Apart from any other cause, breakdown of the lithographers, whose various establishments were glutted with work which could not be properly executed, sufficed to entail a fatal quantity of defects. But, explanations aside, here was the simple fact—the project, or rather projects, collapsed.

This ending of the engineering campaign gave the signal for the opening of a legal campaign, in which I was to a considerable extent involved—not, indeed, in any case as principal, but in sundry cases as witness. During the succeeding four years at least, Mr. Prichard carried on suits against one or other company; and, now at Lewes, now at Westminster, and now in the chambers of an arbitrator (Mr. Keating, afterwards judge) I gave evidence on his behalf: subpœnas pursuing me hither and thither, often to my annoyance and loss. What the final outcome was I do not remember distinctly; but I infer that there must have been a decision which gave to Mr. Prichard and his staff, or some of them, a portion if not the whole of their claims: my inference being drawn from the fact that a sum of some £80, due to me for services as witness before Standing Orders Committee, was, after a further delay of some years, paid under the Winding-up Act.

With this failure of Mr. Prichard's schemes ended my career as a civil engineer. Save during an excursion into

Cornwall early in 1847, along with sundry old engineering friends of Birmingham and Gloucester days, who had been commissioned to take "check-levels," in preparation for opposing the Central Cornish Railway, I had no more connexion either with railway projects or with the execution of projects which had been authorized. Nor did I thereafter enter into any other branch of engineering work.

Should I have made a good engineer had I continued in the profession? The answer is doubtful: in some respects Yes, in other respects No. In so far as inventiveness goes I was adequately endowed, and might have succeeded; though it seems not improbable that inadequate regard for precedent might have entailed compromising mistakes. Much patience is required to learn all that has been done in each field of engineering; and, lacking such patience, I might have come to grief from neglecting the guidance of registered experience. Then, too, the aversion to mere mechanical humdrum work, of which civil engineering, in common with most occupations, involves a good deal, would have stood in the way of advancement. Financial details, altogether uninteresting to me, would most likely have received insufficient attention. An incident which occurred when I was on the Birmingham and Gloucester Railway, acting as engineering-secretary to Capt. Moorsom, suggests this belief. A Russian engineer had been sent over officially to examine our railways, and was being taken round the country by Mr. Vignolles, an engineer of repute in those days. Capt. Moorsom sent me as *cicerone*. One of Mr. Vignolles' questions concerned the amount per cubic yard which our "ballast" of burnt clay cost. I was unable to tell him, and there resulted an expression of contempt on his face: such knowledge being reasonably considered by him as part of an engineer's mental equipment. Another deficiency I recognize as one

which might have prevented any great success—my lack of tact in dealing with men, especially superiors. In most occupations, and especially engineering, advancement depends rather on pleasing those in authority than on intrinsic fitness. The more capable man who is disagreeable has a much smaller chance than the less capable man who makes himself pleasant. Neither in my engineering days nor at any other time, did it ever enter into my thoughts to ingratiate myself with those above me. Rather I have ever been apt, by criticisms and outspoken differences of opinion, to give offence; and I doubt not that this trait would have stood in my way.

But whether I should or should not have made a good engineer was never to be decided. Fate ordered that the experiment should not be tried.

CHAPTER XXII.

INVENTIONS.

1846—47. ÆT. 26—27.

A FIT commencement to this chapter necessitates recurrence to an incident belonging, in order of time, to the last chapter. In a letter dated Leamington, 13th October, 1845, there is a sentence which runs:—"I am anxious to accumulate as much as I can for the purpose of putting myself in a position to take out a patent."

The proposed patent concerned a scheme of quasi-aerial locomotion: not a "flying machine" properly so called, but something uniting terrestrial traction with aerial suspension. There had, during some previous months, been much public attention given to a flying machine proposed by a Mr. Henson or Hanson,—I think that was the name. Representations of it were common in shop-windows; and even pocket-handkerchiefs were stamped with them. The essential idea was that of an inclined plane propelled through the air by a motor engine carried on its back—an idea which has recently been revived by the celebrated American inventor, Edison; whose proposed use of it, however, is, if I remember rightly, limited to the carrying of explosive missiles over an opponent army and dropping them into its midst. There is, of course, nothing to be said against the theory; but against the application of it there is much to be said.

To me it then seemed, as it seems still, that no such appliance (supposing it otherwise successful) could carry

the motor engine and motor power required for a long flight. Even liquid carbonic acid, losing much of its energy by self-refrigeration in becoming gaseous, must fail quickly unless supplied with heat. Adopting the general idea of an inclined plane moving at a high velocity, and supported by the upward pressure of the air reflected from its under surface, my scheme, suggested by the action of a kite when drawn through still air by a boy running, was to attach the ends of the inclined plane, by iron-wire cords, to an endless wire-rope passing over "sheaves," as they are called, such as were then used on various lines of railway and are still used on some tramways. Further, my proposal was that, instead of a single inclined plane, which inevitably would oscillate violently from side to side, there should be two inclined planes meeting in the middle, as do the lateral faces of a properly made kite. Theoretically, such a structure might be drawn through the air at a velocity such that the upward pressure would support it, and support also the weight of seated passengers on its upper surface; and the questions were—whether, by stationary engines moving the endless rope, such a velocity could be given, and whether fit arrangements for starting and alighting could be devised. During the spring of 1846 I spent some thought on this mode of locomotion, and interested in it my new friend Mr. Potter. A letter to my mother, dated from 2, Lloyd Street, Lloyd Square (which had continued to be my address since the migration to town in October, 1845), contains these paragraphs:—

"On Saturday last I dined at Mr. Potter's in company with two M.P.'s—Bright and Brotherton. Cobden was to have been there but could not come.*

"Since then I have, at Mr. Potter's particular request, explained to him my system of locomotion, with which he was both astounded and pleased. He seemed to feel greatly interested, and immediately entered

* Mr. Potter's father had been Member for Wigan in the first reformed Parliament, and had been intimate with the leading Radicals.

upon the question of making the experiment and what it would cost, and quite gave me the impression that he would be ready to assist."

In pursuance of a promise then made to consider the matter in detail and let him know the result, I, in the course of the summer, made some calculations which altogether dissipated my hopes. At each start from a station, the machine would have to be otherwise supported until the velocity given to it had become great enough to yield adequate aerial support; and I came to the conclusion that the strength, and therefore the weight, of the wire-rope required to give it the needful velocity within any reasonable space, would be impracticably great, and that the cost of giving it this velocity every time would be prohibitory. Referring to this calculation, Mr. Potter, in a letter of August 18, wrote:—

"I really was concerned to hear of the untoward conclusion of your hopes, and I confess I agree with you that the difficulty you have stated does seem insurmountable, and is just of that practical kind that would in the first instance escape the calculations of a very stern theorist, as indeed I have always looked upon you."

It did not occur to me that there might be used an endless rope constantly in motion, and admitting of being clutched by the apparatus every time of starting; but any one may see that this, too, would be impracticable for various reasons, and that there are sundry insurmountable obstacles in the way of the plan.

Until there became manifest to me the fatal difficulty above named, I was seriously taking measures to carry out the scheme. Correspondence shows that, after the rejection of our bills by the Standing Orders Committee about the middle of May, and after failing to get a settlement of my claims for services before the Committee, and after spending the latter part of May with my uncle at Hinton, and after abandoning the idea of a trip to Paris for a few weeks, I occupied myself to some extent in preparations for obtaining a patent—preparations, however, which

were, both in June and the early part of July, several times interrupted by subpœnas demanding my attendance as witness on behalf of Mr. Prichard in his suits against the companies.

During the two months in which these miscellaneous occupations constituted my business, there was something else going on, not to be called business, but yet more important in its ultimate issue than business commonly so called. I began to make myself better fitted for writing the book I contemplated. At what time was formed the resolution to set forth my views on political ethics, is uncertain; but during those early months of 1846, I commenced a course of reading in furtherance of my project.

What the course of reading was there is no clear evidence. I obtained from Mudie's Library, which, as before said, was then a thriving infant in Southampton Row, books which bore in one way or other on my set purpose —books, however, which did not bear upon it in the most obvious way. For I paid little attention to what had been written upon either ethics or politics. Partly this was due to my impatience of reading in general (excluding, of course, light reading), which has always made the getting through a grave book a difficulty; and then upon this general difficulty there arose a more special difficulty—the inability to continue reading a book from the fundamental ideas of which I dissented: a trait exemplified in a preceding chapter. Hence it happened that in this case, systematic works of a political or ethical kind, written from points of view quite unlike my own, were either not consulted at all (their reputed doctrines sufficing to warn me off), or else they were glanced at and thereafter disregarded. The books I did read were those which promised to furnish illustrative materials. For though by some I am characterized as an *a priori* thinker, it will be manifest to any one who does

not set out with an *a priori* conception of me, that my beliefs, when not suggested *a posteriori*, are habitually verified *a posteriori*. My first book, *Social Statics*, shows this in common with my later books. I have sometimes been half-amused, half-irritated, by one who speaks of me as typically deductive, and whose own conclusions, nevertheless, are not supported by facts anything like so numerous as those brought in support of mine. But we meet with men who are such fanatical adherents of the inductive method, that immediately an induction, otherwise well established, is shown to admit of deductive establishment, they lose faith in it!

Explanations and reasons apart, however, the fact here to be noted is that in the early summer of 1846, I began to prepare for my first book: having, at that time, no idea of making authorship my occupation.

To the mention of these preparations for my first book, should be added something about the motives which prompted it. Further reflection had made me dissatisfied with the letters on *The Proper Sphere of Government*—dissatisfied, not so much with the conclusions set forth, as with the foundations on which they stood. The analytical tendency had begun to show itself. What was the common principle involved in these conclusions? Whence was derived their ultimate justification? Answers to these questions had become clear to me; and it was the desire to publish them which moved me to write.

Another account of its origin was given by my father to one who, many years later, was inquiring about it—one unknown to me in the days of which I speak, but whose name will appear frequently in the narrative of my later life. My father admired greatly an ethical work called *Essays on the Principles of Morality* by Jonathan Dymond, a Quaker—a work having much merit, but setting out with the assumption, held in common by

Quakers and most other Christians, that the declared will of God is the only possible standard of morals. As implied in a passage describing discussions at the age of 24, I already felt, in a vague way, that there must be a basis for morals in the nature of things—in the relations between the individual and the surrounding world, and in the social relations of men to one another. Hence I had, it seems, spoken of Dymond's *Essays* disparagingly. According to the account of the friend above referred to, I went so far as to say that I could write a better book on the subject myself; and my father, piqued by this disrespectful treatment of a book he thought so highly of, said sarcastically that I had better try. According to his statement, the writing of *Social Statics* resulted from my responsive determination to make the attempt.

I have no recollection of all this; but it is not improbable that I expressed myself in the way alleged, and that my father may have uttered the challenge. Indeed it seems certain that some such incident occurred. But that it originated *Social Statics* I do not think. The dissatisfaction above described was, I believe, the prompting motive; though it is possible that my father's sarcasm served as an additional spur.

The greater part of August was passed at Derby, and it was there I made the calculation which led to the abandonment of my rather wild scheme—though one perhaps less wild than schemes for aerial locomotion in general. But before the end of the month there occurred to me the idea of something which, as results proved, came within the region of practicability.

This was a little apparatus I called a "binding-pin." Its purpose was that of fixing together the sheets of musical pieces which occupy several pages, and also the sheets of weekly periodicals—the *Athenæum*, *Spectator*, and others similarly shaped. The music or journal being

opened out in the middle, these binding pins, being thrust on to it, one at the top of the fold and another at the bottom, clipped all the leaves and kept them securely in their positions; and, when afterwards taken off to be again used for a like purpose, they left the paper uninjured. A drawing and description will be found in Appendix I.

Not very long before, there had been passed an Act intended more especially to give security for Designs, but which, proving to be more widely applicable than its title implied, served to cover small appliances the uses of which depended entirely on their shapes. I decided to take advantage of this system of registration, and, going to London forthwith, went through the requisite legal forms on the 2nd September. Correspondence during the succeeding two months shows how numerous were the difficulties to be surmounted, and how complicated the transactions to be gone through, before even a very simple invention could be brought to bear. There was first the discovery of some mode in which the binding-pin might be cheaply manufactured; and only after trying sundry pin-makers and hook-and-eye makers, did I succeed in finding one who, by modifying a hook-and-eye machine, succeeded in producing it with sufficient facility: an achievement, by the way, which implied much greater ingenuity than did the appliance itself. Simultaneously, there had to be carried on negociations with wholesale stationers or kindred traders who should, one or other of them, undertake the supplying of retail stationers and music-sellers. There is mention of three competitors for the purchase of the invention. Then, after the lapse of two months and a subsequent absence from London, there comes the account of an agreement with the firm of Ackermann & Co.—not the existing firm, but one which at that time occupied the building now occupied by Rimmel the perfumer. Satisfactory arrangements for manufacture and sale having been reached, sundry further

preliminaries required attention. The pins must be presented to the public in an attractive form. I had to make an ornamental design for a card on which they might be mounted; and, having done this, to get the engraving and printing of it in colours undertaken. Still another obstacle had to be overcome. Putting the pins on the cards by the unaided hand would have been tedious and costly; and I had to devise a little apparatus which rendered the fixing of them an easy process—an apparatus which, like the machine for making the pins, implied much more thought than did the pin itself.

All complications, mechanical, legal, and commercial, having been got through, the appliance was brought out in the name of Ackermann & Co. (for I did not like to give it my own name), and met with considerable approval. Had the sales continued to be anything like what they were at first, they would have yielded me a revenue of some £70 a year; but after the first year they fell off and presently ceased. I supposed the fault to be with Mr. Ackermann who was a bad man of business, and who, failing not long afterwards, shot himself; but information gained in recent years has led me to ascribe the result to that insane desire for novelties which, in all save articles almost indispensable, leads to the neglect of a known thing, however satisfactory, and a demand for the last new thing: whether better or not than a thing already in use being a matter of indifference.

Some twenty years ago, samples in a stationer's window showed me that someone had attempted to revive the use of this appliance; but the samples were ill made, and I do not wonder that nothing came of the attempt.

Had it not been for memoranda found among my papers, no mention would have been made of a certain highly-speculative enterprise into which my friend Jackson and I at one time thought of entering—thought only in a half-

serious way, however. That it originated about the period here dealt with there is no proof. My conclusion that consideration of it is referable to this period, results from failure to find any other in which it could have occurred.

We often discussed art-matters: he as being an amateur artist, and I as being interested in art. We went to picture-exhibitions together, and our judgments were generally in accord. From criticisms on pictures we sometimes passed to criticisms on decorations; and in our condemnations of many of these we were, in like manner, usually at one. Might it not be a possible thing to set up a systematic manufacture of designs for textile fabrics, printed or woven, as well as for paper-hangings and the like? Could there not be a methodic use of components of designs, so that relatively few ideas should, by modes of combination, be made to issue in multitudinous products? And could not this be so done that draughtsmen, under superintendence, might produce them with facility: the system serving, as it were, not as a physical kaleidoscope but as a mental kaleidoscope. Some notions were, I see, set down, giving a partially-concrete form to the plan. But, as I have said, the speculation was only half-serious, and nothing came of it.

I mention it here chiefly for the purpose of introducing an accompanying thought respecting the nomenclature of colours. The carrying out of such a scheme would be facilitated by some mode of specifying varieties of tints with definiteness; and my notion was that this might be done by naming them in a manner analogous to that in which the points of the compass are named. The subdivisions coming in regular order when "boxing the compass," as it is called, run thus:—North, North by East, North-North-East, North-East by North, North-East; North-East by East, East-North-East, East by North, East. Applying this method to colours, there would result a series standing thus:—Red, Red by blue, Red-red-blue,

Red-blue by red, Red-blue (purple); Red-blue by blue, Blue-red-blue, Blue by red, Blue. And in like manner would be distinguished the intermediate colours between Blue and Yellow and those between Yellow and Red. Twenty-four gradations of colour in the whole circle, would thus have names; as is shown by a diagram I have preserved. Where greater nicety was desirable, the sailor's method of specifying a half-point might be utilized —as Red-red-blue, half-blue; signifying the intermediate tint between red-red-blue and red-blue by red. Of course these names would be names of pure colours only—the primaries and their mixtures with one another; but the method might be expanded by the use of numbers to each: 1, 2, 3, signifying proportions of added neutral tint, subduing the colour, so as to produce gradations of impurity.

Some such nomenclature would, I think, be of much service. At present, by shopmen and ladies, the names of colours are used in a chaotic manner—violet, for instance, being spoken of by them as purple, and other names being grossly misapplied. As matters stand there is really no mode of making known in words, with anything like exactness, a colour required; and hence many impediments to transactions and many errors. In general life, too, people labour under an inability to convey true colour-conceptions of things they are describing. The system indicated would enable them to do this, were they, in the course of education, practised in the distinguishing and naming of colours. If, by drawing, there should be discipline of the eye in matters of form, so there should be an accompanying discipline of the eye in matters of colour.

There is mention, in the last section but one, of an absence from London which occurred before my arrangements for bringing-out the binding-pin were effected. This absence was caused by a visit into the West of England. Writing to my father on 30th October I said:—

"The letter you forwarded was from Mr. Potter, and contained a very kind invitation to go and spend a week or ten days with them in Herefordshire. I enclose it."

Upper Hamilton Terrace, where their house in London was situated, had proved insalubrious; and Mrs. Potter, who was showing signs of delicacy, had been recommended to spend the winter in a drier climate. The place fixed upon was Gayton Hall, in the valley of the Wye, not far from Ross, amid scenery sufficiently picturesque. Here, as the Americans say, I had a good time. The place was 14 miles from Gloucester, which had occasionally to be visited; and this fact had, I fancy, been Mr. Potter's excuse for setting up a tandem. We had sundry not-altogether-safe drives in it. Then there was a ride to the ruins of Goodrich Castle, for which, being little used to riding, I paid the ordinary penalty next day. Once, too, I joined Mr. Potter in a ramble with our guns about an adjacent tract, the shooting over which went with the Hall, but which, from lack of a keeper, yielded no birds. And I remember, also, accompanying my friends to a dinner with Mr. Herbert, the County-Court Judge at Ross, with whom, nearly a generation after, there occurred a mutual recognition as we were playing a game of billiards together in London. Chiefly, however, I recall the great amount of discussion carried on indoors during my stay. Mrs. Potter was scarcely less argumentative than I was, and occasionally our evening debates were carried on so long that Mr. Potter, often playing chiefly the *rôle* of listener, gave up in despair and went to bed; leaving us to continue our unsettleable controversies.

This visit, which ended in the middle of November, I thus particularize because it was the first of a series too numerous to be recorded, which continued throughout the subsequent forty years.

Why I went to Derby from Gayton I do not understand; for pending business-arrangements appear to have de-

manded my presence in London. The mention of my return to Derby serves, however, to introduce a passage of some significance, contained in a letter from my father to my uncle, dated December 16, after I had again been carried off to London to give evidence for Prichard. It runs as follows :—

"I showed Herbert that I was a good deal concerned as to the notions he appears to be deriving from the reading of Emerson ; but he said very little, and conducted himself in a very much less dogmatical way than on some former occasions. I hope that when the pride of his intellect is a little more subdued, he will be more likely to attach importance to the usual evidences given in support of our faith. How do you bear such attacks? They affect my spirits exceedingly. Mr. Mason [a dissenting minister] and he had a lengthy argument one day lately, in which I confess Herbert displayed much more coolness than I have previously given him credit for, considering the mortifying manner that Mr. Mason has."

On this passage the only remark it seems needful to make concerns the supposed influence of Emerson. This my father over-estimated. My rationalistic convictions (at that time far more exceptional than they would be now) had been slowly and insensibly growing for years : being, as already intimated, caused by perception of the radical incongruity between the Bible and the order of nature. Such writings as those of Emerson and Carlyle served simply to present to me my own convictions under other aspects.

At my old quarters, 2 Lloyd Street, Lloyd Square, I spent the last few weeks of the year 1846 and the spring of the next. A string of extracts from letters will show what I was about. The first of them, however, is of earlier date—18th September; but I have reserved it for use here because it conveniently introduces the quotations from subsequent letters.

"I have ordered you some of the gutta-percha, which they promised to send down in a week—not having any ready. I saw a number of new applications of it at the office—it is certainly a most extraordinary material. It appears that the Company are intending to work the

patents by granting licences, and state that in a few weeks they will have specimens of all its applications ready. Before deciding about the shoe affair I shall wait and see these.*

"I find I am a day after the fair in my invention for raising water. It has just been patented—the specification being enrolled as lately as the 11th ultimo. Clarke, Freeman, and Varley are the patentees, and my plan is included amongst a variety of others.

"The Potters are not yet returned from Liverpool. Jackson is out of town and I am dreadfully off for want of society. One week since I have been here, I did not speak to a friend from Monday to the Sunday following.

"There is nothing whatever stirring in the engineering world, and I see no cause to alter my determination to proceed with a patent. The only question is which."

To my father, late in December, I wrote :—

"The planing affair looks well. . . . . Jackson has finally joined me and we are now busy with a model.

"The current number of the *Noncon.* contains an article of mine—'Justice before Generosity.' Miall being away, they got me to write for them."

Along with the excursion into political literature here named, should be named an excursion into scientific literature, which was made in January or February, 1847. This took the shape of an essay on "The Form of the Earth, &c.," the purpose of which was to show that however good may be the evidence of the earth's original fluidity, the evidence commonly drawn from its oblate form is not

* At that time gutta-percha was a recently introduced material from which much was hoped. This reference to it suggests an extreme instance of perversity in the uses of names; implying something almost like ingenuity in going wrong. When first imported, gutta-percha, though like india-rubber the inspissated juice of a tree, was seen to be conspicuously different in sundry ways. Its colour is a light chocolate; it does not yield to slight pressures; it is inelastic; it is softened by moderate heat, and can then be rolled into sheets—all traits in which it differs from india-rubber. The only manifest point of community between the two is that both are soluble in coal-naphtha. But, strange to say, easily discriminated as they are, they have become so confused in the public mind that their names have partially changed places. Now that the uses of gutta-percha are inconspicuous, its name has in numerous cases usurped the place of the name india-rubber: the majority of people refer to various india-rubber articles as made of gutta-percha!

good. This essay was published in *The Philosophical Magazine* for March, 1847, and will be found in Appendix J.

A letter of February 21st, first speaking of the beforementioned excursion into Cornwall and "afterwards a week of the old work at Westminster" (life in Committee-rooms and their lobbies), goes on to speak of the already-made small model of the planing engine; and on March 10 comes the information—

"We are about to proceed at once with the patent for the planing engine. Our friend Bishopp—a good and unbiased judge [he had been engineer of locomotives on the B. and G. Railway], thinks the performance of the model very favourable; and we do not mean to run the risks of further delay.

"We intend if possible getting a full-sized engine made before the specification is entered."

Then on 11th April, after naming a further stage, I named also a totally different matter of much more interest as judged by ultimate issues.

"The patent has been opposed but no harm has resulted, as it appeared that there was no interference. Another fortnight will now I believe complete the matter.

* * * *

"I have now collected together a large mass of matter for my moral philosophy and it is beginning to ferment violently. I shall commence writing as soon as I get down to you. Among other aids to good style I have been compiling a kind of dictionary of memoranda for illustrations, figures, and similes [of which I never made the slightest use]."

And now came interruptions, pleasant and unpleasant, as shown by some lines from my uncle to my father on April 20.

"Herbert had been with us from Thursday last till yesterday (Monday), when a messenger came from London to take him back to give evidence on a trial respecting Mr. Prichard. We were much disappointed at having so soon to part with him, but we are to have him again at Midsummer to finish his visit."

The patent having been taken out and the needful drawings made, negociations were entered into for the making of a complete machine at Derby. This caused me to go home in the middle of May.

One of the incidents which shortly followed was a temporary return to political activity. Sundry foregoing passages have shown that I had seen a good deal of Mr. Lawrence Heyworth, and that our views were in large measure congruous. A bye-election was about to take place at Derby; and, thinking that Mr. Heyworth would be a good representative, I talked the matter over with sundry leading Liberals in the town, and busied myself in obtaining signatures to a requisition to him. Though the proposal met with considerable approval, nothing at that time came of it. But when, not long afterwards, a general election took place, this action of mine, futile when taken, had its effect. His name and opinions had been made known in the town; and the result was that certain local chiefs of the Liberal party requested me to telegraph to him, to inquire whether he would receive a deputation. I did so. The deputation went; he became a candidate; was elected; and thereafter sat for a number of years as one of the Members for Derby.

This was not the only direction in which my energies were partially diverted from immediate business. A letter of July 11th to my father, who was away for his vacation, indicated the commencement of my intended book.

"I am getting on pretty well with my writing and find the being alone advantageous in making me apply. I do not yet, however, make rapid progress, being very anxious to make a good start in respect of style."

But of course my chief energies were daily devoted to getting made a full-sized planing engine of the proposed kind. Various difficulties were met with, and various difficulties were overcome, and various delays had to be patiently borne. Here let me attempt to convey some idea of this proposed apparatus. Place an ordinary dinner-plate on the table, and suppose that a circular hole is made in the table large enough to let the plate sink through, but that it is stopped before its edge quite disappears below

the table's surface. Suppose, now, that this earthenware plate is replaced by a steel plate, which has a cutting edge instead of a round edge, and which is almost flat, or, in other words, somewhat "dished"; but which, similarly, has its sharp edge very slightly projecting above the level of the table. Now further suppose that such a steel plate, much larger than a dinner-plate, is fixed on a vertical axle carried above and below the table, and that power applied to this axle, makes the steel plate revolve at a considerable velocity. Then it is manifest that when a plank, thrust against the plate on one side of the axle, meets the cutting edge, there will be taken off a shaving, which will descend through the narrow space left between the edge of the plate and the surface of the table. And obviously a plank thus thrust against a rotating edge will have a shaving taken off more easily than were it thrust against a stationary edge.

All through July and August the undertaking was hopefully prosecuted, and then it was brought to an end in an utterly unexpected manner. My friend Jackson, as I have intimated, had joined me in carrying out the invention, and had contributed his share to defray the cost of the patent—about £150 I think the cost was. But now a change of career on his part broke up our arrangement. To my great dismay, about the end of August I got a letter from him saying that he had been offered some civil engineering post in India and that he had accepted it. There went from me a letter of expostulation, and from him there came a reply expressing regret. But there was no help for it—the step had been taken.

Thus ended the enterprise; for I did not feel able to prosecute it by myself. Neither means nor energy would have sufficed. Very possibly, however, this seeming catastrophe was a blessing in disguise. Supposing that all the mechanical difficulties had been overcome, as they might have been, there were still the business difficulties;

and a wider experience of men and affairs leads me to suspect that these might have proved insurmountable.

An omitted incident must here be named. Just before the change which proved fatal to my scheme, came my first acquaintance with mountain scenery. An excursion to Scotland had been planned by a party of four—my friend Lott, one who presently became his brother-in-law, Lingard, another friend of ours named Fuller, and myself. Some time about the beginning of August we left Derby; and our absence lasted a fortnight. Already in 1847, tourist facilities had been developed to a considerable extent throughout the West. There were steamers on Loch Lomond and Loch Katrine; a coach from Inverarnon over the Black Mount through Glencoe to Ballachulish; a line of steamers running backwards and forwards between Inverness and Oban; and another line through the Crinan Canal to Ardrishaig and Glasgow. It is needless to say much about our doings. There still remains a memory of the delight with which I gazed on the mountains at the head of Loch Lomond as we approached them by steamer, and the awe with which, later in the day, some of the more rugged and precipitous masses we drove past inspired me. The only adventure worthy of note was the ascent of Ben Nevis; and this, chiefly because of an accompanying physiological experience, which, joined with one received three years previously, was instructive.

Our ascent was made from Fort William. As we were approaching the summit our guide pointed out a train of ponies and pedestrians coming from Bannavie, and told us that the party consisted of Prince Waldemar and his attendants. After we had been at the top some time, enjoying the views now on this side and now on that, as the clouds lifted to disclose them, these foreign visitors arrived on the top also. Prince Waldemar, a handsome, vigorous-looking, and pleasant man, had in his suite two

whom I remember—a Count Oriola, and, oddly enough, a Baron Munchausen: so at least we understood the names. Having unpacked their luncheon, they hospitably invited us to partake. We had already eaten our sandwiches, but were not unwilling to add some glasses of wine to the whisky we had imbibed in the course of our ascent—a bottle among five, the guide and ourselves.

The upper part of Ben Nevis consists of a long slope of loose rocks, large and small, standing at the somewhat precipitous angle which a *débris* of such masses naturally assumes. When we commenced going down, I found myself possessed of a quite unusual amount of agility; being able to leap from rock to rock with rapidity, ease, and safety; so that I quite astonished myself. There was evidently an exaltation of the perceptive and motor powers. On thinking over the matter afterwards, I was reminded of a parallelism between this experience and one above referred to. This had occurred when making the trial-section named in the last chapter. All day I had been hard at work taking levels between Warwick and Alcester, and was anxious to reach a certain "bench-mark" before it became too dark to see. Just when beginning to fear I should not succeed, we passed across a turnpike road (from Stratford to Birmingham, probably) close to a public-house. Being very thirsty I went into it for a glass of ale, and, finding my thirst not slaked, took a second. Shortly after resuming my levelling I was struck with the remarkable expertness of my operations. One or two movements of the level-legs brought the bubble almost right, and a touch or two of the set-screws made the adjustment perfect, as though by magic.

Here, then, were two cases which, unlike in other respects, were alike in the respect that a considerable amount of alcohol had been taken along with, or after, an extreme amount of exercise. Now alcohol has two physiological effects. Primarily it stimulates the nervous system, and,

in that way, exalts the functions at large; but, secondarily, it diminishes the rate of exchange of gases in the lungs, and, by so doing, tends to diminish the functional activity. Rather deficient as I am in development of the respiratory system, and consequently having a rate of exchange of gases somewhat lower than it should be, the ordinary effect of alcohol is sedative only: the beneficial effect on the nervous system is out-balanced by the adverse effect upon the respiratory system. But in those two cases, long-continued exertion having caused unusually great action of the lungs, the exaltation produced by stimulation of the brain was not cancelled by the diminished oxygenation of the blood. The oxygenation had been so much in excess, that deduction from it did not appreciably diminish the vital activities.

After recognizing the varying proportions of these conflicting actions, we understand why in one person alcohol exhilarates and in another enervates; and why in those of the first class a certain amount produces exhilaration and a further amount enervation.

The second week in September found me in London again. The purposes of my journey were to see Jackson before he went to India, and then, while attending to some pending matters of business, to look round.

Steps were taken to increase the sale of the binding-pins. It appears, too, that sundry further schemes occupied my attention—one an improvement in the type-making machine named some chapters back, and others which also remained mere speculations. While part of my time was spent in negociations concerning inventions, another part was spent at the British Museum library, in search of materials for my book. It appears, too, that the composition of the book was continued; for, after a time, there is mention of some thirty pages of MS. of the Introduction being sent to my father, with a view to criticism by

him. Meanwhile my daily life was not to my liking, as witness the following paragraph written to Lott, dated 42, Holford Square, Pentonville, 11th October:—

"I am quite alone—have not spoken to a friend for this week past—and am more moped than ever; so that you can hardly expect that I have any news to tell you. Engineering is of course desperately bad; and, were it not that the binding-pin answers very well, I should be in a quandary. I shall be very glad to see you here whenever you can get away."

A little later came a brief episode. My uncle Thomas had long been wishing to free himself from the ties of his pastorship at Hinton, that he might have a larger sphere of usefulness. Frequently, if not generally, he was away from home during the week, lecturing or attending meetings (chiefly, but not wholly, in furtherance of the temperance movement), at one or other place, often remote; and habitually returned on Saturday night that he might give his two services on Sunday. And now the desire to resign his incumbency was suddenly accentuated by a burglary at the parsonage. That after the many good things he had done for the people of Hinton during his twenty years of residence, such an event should have happened, disgusted him greatly—perhaps somewhat unreasonably; for there was no proof that the robbers belonged to his parish. When he announced his decision to leave there came a memorial from all the leading parishioners urging him to remain; but, while he recognized the force of their address, it did not alter his mind. This crisis took me to Hinton. From my uncle to my father on the 25th went the information:—"Herbert is here and is very well. I hope he will stay till my departure, as he will be very useful in giving advice."

With my return to London soon after, and my return to Derby not long after that, came to an end the various schemes which had occupied me during the preceding year and a half—time, and energy, and money, during that period having been simply thrown away. What came to

me in the shape of proceeds from the binding-pin, just about served to recoup me for my share of the cost of the planing-machine patent; and the expenses of living and travelling which had meanwhile been incurred, were of course so much loss. My experience is, I suspect, very much the experience of most who have tried to make money by inventions. Non-success, due now to unforeseen mechanical obstacles, now to difficulties in obtaining adequate pecuniary means, now to infringement of patent rights, now to unfair treatment by a capitalist, is almost certain to result. Probably it is not too much to say that there is one prize to fifty blanks.

Shortly after the incidents above chronicled there came a second visit to my friends at Gayton. Whether it took place before I returned to Derby, or whether I went to Gayton and thence to Derby, I do not feel clear; but I think the last. I remember nothing about the visit further than my failure to aid in the rectification of a water-ram supplying the house, which was continually going wrong.

At home, during the winter and succeeding spring, there was resumed that miscellaneous and rather futile kind of life which had on previous occasions been passed there. I have no letters of this period serving to refresh my memory. Probably I was occupied every morning with further chapters of my proposed book. Then, weather permitting, there came the afternoon rambles in the country, during which the subjects I was dealing with occupied my thoughts. Relaxations were much what they used to be —meetings for glee-singing; evenings spent with Lott and his family; meetings of our Literary and Scientific Society; occasional attendance at lectures; and now and then a game at chess.

Things went on in this way until April, unvaried by any incident save the before-mentioned election of Mr. Heyworth as Member for Derby, in which I took part.

CHAPTER XXIII.

SUSPENSE.

1848. ÆT. 28.

WHAT was to be done? I was now 28 years of age, and all that had passed since I was 21, had left me stranded again. The intervening seven years, which should have given me a settled career in life, had, after sundry ups and downs, ended without result. Partly this was my own fault, and partly not. At the beginning of this period I had thrown myself off the rails, and in the course of it had twice been thrown off the rails by no failure or deficiency of my own; and what other futile efforts I had made had implied unwisdom rather than inability. But now what was to be done?

In the course of the spring, emigration was suggested, as witness a letter to my uncle dated Derby, 10th April.

"Mr. Potter during his late stay in Derby (where he came to assist in Mr. Heyworth's canvass) said so much in praise of New Zealand as almost to make me feel inclined to go there. There seems so little chance of making way in England, especially under the present depressed state of things, that one feels almost ready to take any step rather than wait longer for the turn of the tide. I own, however, that I should have great difficulty in making up my mind to leave the civilized world; more particularly as I feel that I can render some service by remaining in it."

Another thought which arose was that of reverting to the ancestral profession. A dozen or more years previously, a Dr. Heldenmaier had set up, somewhere to the north of Derby (I fancy it was near Worksop, in Nottinghamshire) a school conducted on the Pestalozzian prin-

ciple—a kind of English Hofwyl. He had occasionally called on my father, and the neighbouring presence of his establishment was a fact familiar to us. Might it not be possible for my father and myself to do something similar; not, indeed, to carry out the principles of Pestalozzi in particular, but to initiate an advanced form of education? For the linguistic teaching, masters might be employed; while the teaching of the sciences—mathematics, physics, chemistry, astronomy, &c.—we might carry on ourselves. Our views on education were quite in accord; in both of us the powers of exposition were greater than usual; both had abilities to interest pupils and concomitant interests in them. The idea was discussed; not, however, with much faith in its practicability. Some correspondence with my uncle took place concerning it, and there arose the question—might not Bath, or some place between Bath and Bristol, easily accessible from the two places, be a desirable locality? A preliminary test was suggested. Would it not be well to see what demand there was for science-teaching in that neighbourhood; and, to this end, might I not make the experiment by giving lessons, not in mathematics only, but also in engineering-drawing, perspective, and the like: so discovering whether there would be an adequate response?

It was decided that at any rate it would be well if I were to visit my uncle, who had at that time taken a house in Bath (6, Ainslie's Belvedere), where, while inquiries were being made and opinions gathered, I might renovate my mathematics, which, during the preceding dozen years, had grown rusty. On April 23rd, just as my 28th year was closing, I left home to see whether yet another career might be commenced. Letters between that date and the 11th May, contain discouraging reports. Bath, then rather at a low ebb, was peopled largely or chiefly by retired Anglo-Indians, military and naval officers on half-pay, and the widows and children of such; and, as might have been

known beforehand, the field was one unfavourable to anything beyond the ordinary humdrum education. Very soon it became clear that not only the larger enterprise but even the more modest enterprise would be hopeless, and before the middle of May the idea dropped through.

The trait, common to children's stories and fictions of ancient type, the characters in which, positively good or positively bad, are represented as eventually reaping the rewards of goodness and the punishments of badness, is a trait pervading nearly all ethical speculations, as well as current conceptions about life at large. Always we hear dwelt on the evils which vice brings, while the evils which virtue often brings are practically ignored. The tacit assumption is that "poetical justice" will in one way or other be done; notwithstanding daily proofs that the wicked often thrive and meet with no reverses, while the worthy often pass their lives "in shallows and in miseries," and occasionally bring on themselves disasters by their righteous conduct.

In my uncle this crude notion that merit and demerit always bring their normal results, which Job's friends expressed thousands of years ago, took the form of an unqualified belief in the sufficiency of self-help—a belief that if a man did not succeed in life it was his own fault. This belief, early formed, had been greatly strengthened by the wide experience which many years had yielded him of paupers and pauperism. The multitudinous cases in which misconduct and distress stood in the relation of cause and consequence, shut out of view the cases in which distress arose without misconduct. He had in fact come entirely to ignore good fortune and bad fortune as factors in human life. Doubtless he would have admitted that, without any fault of his own, a man may be knocked on the head by a chimney-pot on a windy day, or be injured for life by the accident a runaway cab-horse

entails on him, or contract a fever, constitutionally very injurious if not fatal, by travelling in an infected railway-carriage; but he did not recognize the truth that in the social world, as in the physical world, there occur catastrophes for which the sufferer is not responsible, and other catastrophes implying no greater defect in him than misjudgment or lack of experience.

He was now suddenly awakened to this truth by the loss of a large part of his property, consequent upon an uncritical acceptance of representations made to him. All through life he had had a horror of speculation; chiefly caused by contemplating the losses his brothers had suffered from entering into the lace-manufacture in the days of its sudden prosperity. But one result of keeping clear of all business-dangers was that he failed to learn where business-dangers lie. In a measure he illustrated, by antithesis, the Shakespearian saying that "out of the nettle danger we pluck the flower safety." Never having nettled himself by running small financial risks, he did not know the aspects of financial risks, and unawares ran into a great one.

When he gave up his incumbency he decided to reinvest his property and that of my aunt, which had, up to that time, been in the funds, yielding but 3 per cent. It seemed clear to him that he might safely obtain a higher percentage. Out of the many railways projected during the mania, the South Wales Railway was one which had something like a sound mercantile basis. Parliamentary authority had been obtained; and, at the time I speak of, the works were in progress. It was put before the world as being guaranteed 5 per cent. interest by the Great Western Railway Company. The guarantee seemed ample to my uncle, and doubtless to most others. The long reaction which followed the mania continued, and railway-shares in general were greatly depressed: sound properties as well as unsound properties being affected. Hence it

seemed, as was represented to him by the secretary of the South Wales Company, that shares in good undertakings would be certain presently to rise, and that he would profit by buying more shares than he could eventually hold, and selling some to pay the calls on the rest. This advice he acted upon: taking a like step, too, in respect of the guaranteed shares in another railway.

Only after these transactions had been effected did they become known to me; and the knowledge of them, when I received it, alarmed me much. I was sufficiently acquainted with the financial arrangements of such undertakings to feel sure that the Great Western Company had not given to the South Wales Company an *unconditional* guarantee of 5 per cent. on its stock; but that this guarantee was limited to a specified capital, which was alleged to be sufficient to make the line. Further, I felt sure that in this case, as in most, if not all, cases, the estimated cost would fall short of the actual cost, to some extent and probably to a great extent; and that, consequently, the sum forthcoming as interest on the specified capital would not suffice to pay 5 per cent. on the actual capital. A further obvious inference was that, since business-men would recognize this limitation of the guarantee, the shares would not rise as represented; but would remain depressed, if, indeed, they did not fall.

During the period of my visit these conclusions and anticipations were being verified. Part of his shares my uncle had to sell at a lower price than he gave for them, that he might meet the calls on the remainder: a ruinous process common in those days, which, from time to time repeated, was figuratively compared to feeding a tiger with legs of mutton.

In the course of our conversations I expressed the opinion that the value of the investment must in great measure be determined by the ratio between the estimated cost of the line and its actual cost; and that if evidence

could be obtained that the difference would not be great the prospect might be hopeful.

Soon after the middle of May I left Bath for London: two motives prompting the journey. One was a desire to pursue the inquiry just indicated. My uncle got, from the secretary of the South Wales Company, an authority to inspect the plans and sections, for the purpose of enabling me to form a rough idea about the sufficiency or insufficiency of the estimate. With this authority in my hand I went to Mr. Brunel's offices; and, after I had produced it, a subordinate in the drawing-office put the plans before me. While I was looking at the sections, Mr. Brunel himself came into the room. He inquired who the stranger was. On being told, he came to me, and, after demanding my business, asked in an angry way whether I could judge the sufficiency of the estimate by inspecting the sections. My reply was that I did not expect to do anything more than see whether the works were of ordinary or of extraordinary magnitude, and whether, from the general aspect of them, it might be inferred that the cost per mile would or would not be greater than usual. Thereupon he went away in great wrath at the implied scepticism respecting his estimate; though he must have been well aware that scepticism was in every case well justified. Concerning the result of this inspection no memory remains; nor do I find any letter telling my uncle of the impression left on me.

Here let me seize the occasion for saying something about the distribution of honours, common in England. Many years ago I saw a drama the subject-matter of which was the discovery of printing, and the burden of which was:—"Honour to whom honour is *not* due." Mr. Brunel's career might fitly be instanced to show that this is frequently the way of the world. Setting out from a place of vantage, as being "the son of his father," he first became famous by the introduction of the broad gauge,

which was eventually extended over 1,450 miles, at a cost in extra works of four and a half millions. After serving for half a century to cause, by break of gauge, great waste of time, labour, and money in the shifting of goods, probably entailing a further loss of a million or two, the broad gauge has been abandoned. Then there came the *Great Eastern* steamship. In raising the capital for this, the financial tactics of Mr. Brunel led my friend Mr. Potter, who was one of the original board, to resign; and the history of the vessel was a history of commercial failures, until the final breaking up of it some years since: further large losses being thus entailed on shareholders. Yet again, there was the adoption, on an extensive scale, of the atmospheric system of traction; the apparatus for which was laid down by Mr. Brunel on the South Devon line at a net cost of £360,000—more capital thrown away; for after a lengthened trial the system had to be given up.* And then, on a successful achievement which brought him credit—the Saltash bridge—there has to be made the comment that it was in part not his but that of my friend Mr. Hughes, whose method of founding bridges in deep water-ways, personally carried out by him at Mr. Brunel's request, rendered the bridge a possibility.

For having thus done much work which had to be undone, wasted many millions of national capital, and entailed great losses upon multitudes of citizens, Mr. Brunel was knighted and is commemorated by a statue on the Thames Embankment!†

The other, and doubtless the chief, purpose of my journey to London, was to look round again with the view

* The figures given in this paragraph are based on information furnished me by the secretary of the Institution of Civil Engineers.

† When the Saltash bridge was opened there appeared in *The Times* for 4th May, 1859, a laudatory account of it, praising Mr. Brunel for the skill with which the difficulties of founding the bridge had been overcome. Feeling indignant that my old friend should be thus defrauded of the credit

of finding something to do. Railway-enterprise being for the time stopped, engineering was almost out of the question, and a literary engagement seemed the only possibility. A letter written home on May 22nd speaks of things in prospect. One was a forthcoming interview with "Mr. Cassell, the proprietor of a new weekly journal about to be started shortly." A succeeding sentence speaks of a change in the proprietorship and literary staff of *The Daily News*, as likely to take place; and a subsequent letter, referring to this, says:—

"I had hopes of making an engagement on *The Daily News* which Gilpin, the publisher, had had offered to him, and had some thought of taking, but he has unfortunately for me changed his mind."

But, as viewed in the light of subsequent events, the most important passage in the above-named letter of 22nd May, was the following:—

"My uncle gave me a letter of introduction to Wilson, the editor of *The Economist*. He treated me very civilly and invited me to tea at his house on Saturday evening. I saw there a very interesting French lady—the Comtesse de Brunetière—who is a daughter of Tallien, one of the notables of the first French Revolution. She is intimately acquainted with all the leading politicians of Paris and gave us some very curious details of the late events. Mr. Wilson told us that she had prophesied the leading events of the late revolution two months before they occurred."

It seems well here to name the circumstances under which Mr. Wilson, originally engaged in trade, had come into the position he now occupied. *The Economist* had been established by the Anti-Corn Law League as a propagandist organ, and, as usually happens with new papers,

due to him, I wrote a letter to *The Times* stating the facts of the case, and, in proof, referred to some independent evidences. One of them was that in recognition of his invention, described in a paper read to the Institution of Civil Engineers (see Vol. X of their Journal), Mr. Hughes was awarded the Telford medal (see Vol. XI, 1852). But though at that time my name was not quite unknown, and though I gave verification, my letter was not published. It was the policy of *The Times* never to admit an error. That a man should be robbed of the honour due to an important invention, was a matter of small consequence compared with the disclosure of a mistake made by *The Times* reporter!

had, I believe, after entailing for a length of time large losses, disgusted those who furnished the money: making them ready to part with it at a great sacrifice. Mr. Wilson, who had written a work on *The Influences of the Corn-laws*, and was, I presume, in intimate association with the leaders of the league, and probably had already furnished editorials and other literary material to *The Economist*, saw in it the making of a successful journal. Under what conditions the transaction was effected I do not know; but the paper had come into his hands as both editor and proprietor. He worked on it indefatigably—living at *The Economist* office to devote his whole time to it; and, being a man of good business judgment, sufficient literary faculty, and extensive knowledge of commercial and financial matters, soon made it an organ of the mercantile world, and, in course of a relatively short time, a valuable property. Meanwhile, though at what time I do not know, he had been elected member of Parliament for Westbury; and, subsequently, he had been appointed Secretary of the India Board, or Board of Control—a government department which had for its function to supervise the doings of the East India Company, then still existing. He had thus risen in a short time, by sheer force of ability and energy, to a position of considerable wealth and influence. Concerning a subsequent call upon him, which occurred some three weeks later, a letter home says:—

"I had a long interview this morning with Mr. Wilson, M.P., who manifested some interest in my proceedings and inquired how I should like a *sub-editorship to a London weekly paper*. This was put in such a manner as to lead me to suppose he referred to *The Economist*. Our interview ended with his requesting me to leave my address with him, with the understanding that he would write to me if an opening should present itself."

On the first, or on the second occasion, I gave to Mr. Wilson a copy of my pamphlet on *The Proper Sphere of Government*, with the general tenor of which he expressed himself in sympathy, though making qualifications.

Possibly the sum which seemed thrown away over the republication of the letters to *The Nonconformist*, was not after all thrown away.

The middle of June found me once more at Derby—once more reverting to my unprofitable life: unprofitable, that is, in a pecuniary sense. I had, indeed, made an engagement to write a leading article weekly for the new paper above referred to, which was to come out under the assuming title of *The Standard of Freedom;* but it was not yet launched, and even had it been launched the proceeds of one article per week would not have sufficed to meet my expenses in London.

Though I had forgotten the fact, letters show that I did, after this paper started, contribute some articles: one of them, I see, entitled "*Tu quoque*," being applauded by my uncle Thomas. But the writing of these accounted for only a small expenditure of time during the autumn. My time was chiefly expended over some chapters of my intended book. These now possessed me a good deal. There were many rambles through the fields in deep thought about them; for my thinking was then, as always, done largely, if not mainly, while walking. The mental absorption, thus caused, was not altogether harmless. There were some disturbances of health which later experience led me to interpret as having had a nervous origin. Repugnance to long-continued attention, which has been one of my traits throughout life, is possibly due to the fact that my nervous system gives way under strain sooner than most do. That aversion to monotony of every kind, which was named in a previous chapter as an organic trait, appears to be illustrated both in the impatience of those repetitions of an effect which exhaust a particular part of the nervous system, and in the inability of the nervous system as a whole to bear persistent action of one kind. I suspect that the peculiarity is at root a physio-

logical one—a want of tone in the vascular system. The vessels lose too soon their normal contractility under stress, and then fail to carry on nervous repair at a rate which keeps pace with nervous waste.

No further memories concerning those autumn months of 1848 remain with me; save, indeed, of some pleasant excursions. There had by that time been established in Derby, as in many other places a Saturday-afternoon holiday, and the Midland Railway Company had, as a consequence, set up a Saturday-afternoon excursion train which was utilized by all classes of the townspeople, and carried them at low fares into the picturesque parts of Derbyshire. Among the few pleasures which the time yielded me, were expeditions with my friend Lott and the ladies of his family into one or other of the Derbyshire dales; where, after more or less of scrambling and enjoyment of the picturesque, there came, before returning home, "a tall tea" at some primitive inn.

Inspection of correspondence, however, disclosing various forgotten letters, makes up in part for missing recollections, and furnishes me with one passage well worth quoting. After only about a year's absence, Jackson had returned from India: his engagement having, in some way I do not remember—probably abandonment of the undertaking with which he was connected—been brought to an end. He was again adrift in London; and once more seeking for something to do. In a letter written soon after he came back, he moralized thus:—

"I have thought much of matters, perhaps not so deeply as you have nor with such a metaphysical mind, but one thing has struck me as regards yourself, namely, that you who have much brighter intellect and stronger powers of mind do not succeed so well in general as others far your inferiors. And why should it be so? I believe in a great measure because you oppose your views to others too directly. I have done so also, and have suffered in proportion. We should follow the stream as far as we can without any breach of principle, keep any peculiar views we have to ourselves, and endeavour to please and be pleased with every thing or person we meet or see. As regards our

own happiness, we are more likely to increase it this way; and certainly we are more certain of making friends, which should be an object kept in view. . . . Perhaps you will say it has nothing to do with business, but it has, for when you differ from others in opinion upon any topic, it induces an unfriendly feeling and eventually the acquaintance is broken off."

When the self-criticisms which close Chapter XXI were dictated, the existence of this passage was unknown to me. On discovering it I was of course struck by its agreement with what I had said. When a man's opinion of himself coincides with the opinion held by his most intimate friend, there cannot be much question about its truth.

And now, after five months of uncertainty, there came the offer I had been led to expect. I cannot recall my state of mind; but naturally, after so long a delay, it was not a very hopeful one; and I had become so inured to disappointments that probably I looked forward to another with calmness. It is not in my nature to be greatly elated or greatly depressed; and I suppose this constitutional equanimity was displayed at the time there reached me the following letter:—

"FONTAINVILLE, WESTBURY, WILTS,
"*November* 15*th*, 1848.

"DEAR SIR,—I am in receipt of your note of the 13th. The situation now vacant in *The Economist* Office is that of Sub-Editor, which, while it requires a regular attendance at the office, does not impose heavy duties. You would have a room to yourself, and considerable leisure to attend to any other pursuit, such as preparing a work for the press, especially from Friday night until about Wednesday in the following week. At first the salary would be one hundred guineas a year. If you were disposed to live on the premises you could have a bed room and attendance free. The messenger and his wife live there, and I used to sleep there when my family was out of town, and they attended on me.

"If I found that you could contribute leading articles there would be an additional allowance.

"The vacancy has existed for some time (it has been temporarily filled), and as I have about seventy applications for it—to none of

which I have replied—you will please say by return of post if you feel inclined to take it, and if so I will appoint a time for you to meet me in town.

"I am, dear Sir, yours truly,

H. Spencer, Esq. "JAMES WILSON."

Though the salary offered was low, yet the accompanying advantages practically raised it to a respectable amount. Evidently, accommodation which Mr. Wilson found good enough for himself when his family was away, would be good enough for me; and when to free residence were added free attendance, fire, and lights, the total would practically amount to something like £150. Then, too, the offer of extra pay for leading articles, if I wrote them, added something; though I had no thought of taking advantage of this possible source of more income. The light work and abundant leisure which characterized the post, formed to me a further attraction; for would not the progress of my book be greatly facilitated? No reason for hesitation presented itself, and I forthwith accepted.

There remains to be noted here a remarkable coincidence. For a short time in 1844, I undertook the functions of sub-editor; and now again in 1848, I undertook the functions of sub-editor. In each case the editor under whom I worked was a Scotchman. In each case the name of this Scotchman was Wilson. In each case the name of this Scotchman was James Wilson. It is doubtless true that Wilson is a rather common Scotch surname, and James a very common Scotch Christian name; but still it is strange that I should have stood in exactly the same relation to two men who were alike in nationality, in surname, and in Christian name.

Thus an end was at last put to the seemingly futile part of my life which filled the space between 21 and 28—futile in respect of material progress, but in other respects perhaps not futile.

There had been, during those years and four preceding years, a varied intercourse with men and things. In surveying and levelling, in making drawings for railway works, and in discharging the functions of secretary and sub-engineer, my first engineering period was passed. After this came a time of scheming and experimenting—mechanical, chemical, electrical; and a time during which there was some artistic cultivation in drawing, modelling, and music, as well as some pursuit of natural history: a time, also, of public political activity, as well as political writing, broken by brief efforts to open for myself a literary career. Then followed a second engineering period, bringing me in closer contact with the preliminary business of railway-making; joined with the exercise of some authority, as the regulator of assistants and supervisor of plans. There was thus afforded me, along with increase of technical experience, increased experience of men—a further increase of this last experience being brought by entanglement in law-suits. Next came the period distinguishable as that of inventions—successful and unsuccessful, but chiefly the latter. This extended somewhat further my physical knowledge, as well as my knowledge of life, its difficulties and its ups and downs; which last was added to during the subsequent period of suspense. In short, there had been gained a more than usually heterogeneous, though superficial, acquaintance with the world, animate and inanimate. And along with the gaining of it had gone a running commentary of speculative thought about the various matters presented.

Though I have called this acquired knowledge superficial, which in one sense it was, it was in another sense not superficial. There was commonly shown a faculty of seizing cardinal truths rather than of accumulating detailed information. The implications of phenomena were then, as always, more interesting to me than the phenomena themselves. What did they prove? was the question instinctively

put. The consciousness of causation, to which there was a natural proclivity, and which had been fostered by my father, continually prompted analyses, which of course led me below the surface and made fundamental principles objects of greater attention than the various concrete illustrations of them. So that while my acquaintance with things might have been called superficial, if measured by the *number* of facts known, it might have been called the reverse of superficial if measured by the *quality* of the facts. And there was possibly a relation between these traits. A friend who possesses extensive botanical knowledge, once remarked to me that, had I known as much about the details of plant-structure as botanists do, I never should have reached those generalizations concerning plant-morphology which I had reached.

It should be noted, too, that the natural culture effected by direct converse with the world around, had been accompanied by little artificial culture; and this little not of a rigorous kind. I never passed an examination; nor could I have passed any such examinations as are commonly prescribed. In Euclid, algebra, trigonometry, and mechanics, I might have done fairly well, but in nothing else. How far did this lack of academic training affect the ultimate result? The very conception of training, as carried on in the past and as still carried on, implies a forcing of the mind into shapes it would not otherwise have taken—implies a bending of the shoots out of their lines of spontaneous growth into conformity with a pattern. Evidently, then, a mind trained, in the ordinary sense of the word, loses some of its innate potentialities. Doubtless in most cases the potentialities are of little account; and such improved capacities as academic discipline produces, are without set-off in the form of lost originality. But in some cases the knowledge gained is of less value than the originality lost. The soul of evil in things good is everywhere shown by

the defects which accompany superiorities. On the one hand, though academic discipline gives a certain fulness of information and readiness to use it in ordinary ways, in diminishes the ability to use information in ways which are not ordinary. On the other hand, while the absence of academic discipline leaves greater freedom of mind, it leaves also a liability to mental action unguided by adequate acquaintance with facts. To the intellectual nature, as to the moral nature, restraint yields benefits with drawbacks; while liberty also yields benefits with drawbacks. In my own case the advantages which intellectual freedom confers seem to have outweighed the disadvantages.

But now this period of miscellaneous activities, and spontaneous development of mind, terminated. Sometime in December, 1848, I left Derby for London: there to commence the journalistic duties which, in course of years, led, step by step, to my special business in life.

[NOTE.—After I had given the order to stereotype these pages, but before the order had been executed, I glanced through a biographical sketch of the celebrated engineer, John Ericsson (based on accounts given by Mr. W. C. Church), and in it met with the following significant passage:—

"When a friend spoke to him with regret of his not having been graduated from some technological institute, he answered that the fact, on the other hand, was very fortunate. If he had taken a course at such an institution, he would have acquired such a belief in authorities that he would never have been able to develop originality and make his own way in physics and mechanics"

The reading of this reminded me of a no less significant passage contained in the report of an interview with that remarkable self-educated man Mr. Edison (quoted on page 167), to the effect that college-bred men were of no use to him. It is astonishing how general, among distinguished engineers, has been the absence of education,

or of high education. James Brindley and George Stephenson were without any early instruction at all: the one taught himself writing when an apprentice, and the other put himself to school when a grown man. Telford, too, a shepherd boy, had no culture beyond that which a parish-school afforded. Though Smeaton and Rennie and Watt had the discipline of grammar-schools, and two of them that of High Schools, yet in no case did they pass through a *curriculum* appropriate to the profession they followed. Another piece of evidence, no less remarkable, is furnished by the case of Sir Benjamin Baker, who designed and executed the Forth Bridge: the greatest and most remarkable bridge in the world, I believe. He received no regular engineering instruction. Such men who, more than nearly all other men, exercise constructive imagination, and rise to distinction only when they are largely endowed with this faculty, seem thus to show, by implication, the repressive influence of an educational system which imposes ideas from without instead of evolving them from within.

These facts, which I had not in mind at the time I wrote the foregoing section, yield confirmation of the inference drawn in it. This inference, presented in its most general form, is that the established systems of education, whatever their matter may be, are fundamentally vicious in their manner. They encourage *submissive receptivity* instead of *independent activity*.]

PART VI.

CHAPTER XXIV.

BEGIN JOURNALISM.

1848—50. Æt. 28—30.

The above title is a somewhat misleading one. A journalist is usually understood to be one among whose functions is that of influencing public opinion by articles and comments. I had no such function. Replying early in 1849 to a letter from my uncle Thomas, I said—

"You inquire respecting the particular department of the paper with which I have to do. I cannot better answer than by saying—with all parts except the Leading Articles, Agriculture, Literature, and the summaries that appear under the heads of "Bank returns and Money Market" and "Commercial Epitome." All other matters I have to superintend. I have the offer to write leading articles if I wish to do so; but I refrain from this from the desire to devote all my spare time to my own private writing, which I consider of more importance than the extra remuneration I should obtain by writing for the paper."

This mode of describing my duties makes them appear more onerous than they really were. Their comparative lightness will be seen from the following paragraph contained in a letter to Lott, written at the end of April.

"I am happy to say that I can answer your inquiries as to my position with tolerable satisfaction. The place suits me on the whole remarkably well, and now that I have got pretty completely acclimatized I have nothing important to complain of and much to approve. In the first place I am almost wholly my own master; scarcely coming in contact with Mr. Wilson more than once a month, and this, with my rebellious tendencies, is a great blessing. Then again my work is decidedly light. Even I, with my invincible idleness, am obliged to admit this. On Saturday, Monday, and Tuesday, I have nothing to do but to read through the *Times* and *Daily News* [and less attentively the *Morning Chronicle*, then in its old age], extract what may be needful, and put it aside for subsequent use. On

Wednesday and Thursday my work occupies me from ten until four. Friday is my only hard day, when I have to continue at it until 12½ or 1 at night. This, however, is a very small payment to make for having so much time at my own disposal; permitting me as it does to go where I please, and when I please, during the early part of the week."

The last advantage I from time to time utilized by making excursions out of town, and at longer intervals paying visits.

Of course under the conditions above described, I was able to adjust my daily routine very much as my own convenience dictated. After breakfast at half-past eight, came a walk in St. James's Park or the Green Park. On my return I did such work as had to be done in the way of reading and abstracting materials, joined with such administrative duties as devolved on me. Then at 1 o'clock there was an adjournment to dinner; for I adhered to the older usage, both on grounds of convenience and on grounds of health.

A few years earlier had been established the Whittington Club, occupying the premises previously known as the Crown and Anchor Hotel—a place famed, in days of active agitation, for political meetings held in its great room. Being but five minutes off, it served as a convenient place for dining; and I joined it chiefly for that reason. It had, however, further advantages. When writing home I said of it:—"there is access to all the British and Foreign literature of the day"; and this, or the contents of the library, often detained me for an hour in the afternoon. So far as I can remember, the afternoon was otherwise usually spent in some miscellaneous way.

My private work was done in the evenings, and, as it would seem, by necessity; though I do not now understand the origin of the necessity. A letter to my mother in February says—"I expect that if I am to make anything worth calling progress with my book, I shall have to do it by writing at night. In fact what I have done has been

done at that time." Probably a part cause was that earlier in the day I could not insure the requisite quietude.

Though *The Economist* rarely gave any space to accounts of entertainments or criticisms on exhibitions, yet there were given to it, not however in full measure, the usual free admissions; and of these I made considerable use. Press "orders" are always for two persons; and of course the ability to take a friend added to the temptation held out by anything to be seen or heard. The letter above quoted, after describing the lightness of my duties, goes on to say:—

"To these advantages may be added the facility of access to sundry amusements in the shape of exhibitions and theatres. I do not profit much by this, however, having been, as far as I can recollect, only twice to the Opera, twice to Drury Lane, and some four times to the Haymarket, since I have been here [nearly five months]. The fact is that I am rather chary of my evenings; seeing that what writing I do (and it is, I am sorry to say, very little) I generally do between 7 and 12 at night. However, though I make little use of the theatre orders myself, I have the privilege of giving a few away to my friends, which is worth something."

On the acting of serious drama I am critical, and easily repelled by defects, of which there are usually many. But being then, as now, ever ready to laugh, comedies and farces, if tolerable, habitually proved attractive. Provided they were not characterized by mere buffoonery, I was content to ignore their faults, numerous though these might be. Still, I was less easily pleased than the majority. Often I was made melancholy on witnessing the applause given by well-dressed audiences to "break-down" dances which aimed at drollery and missed it, and to so-called comic songs containing neither wit nor humour.

To the Opera in the Haymarket I had but occasional access; but to the Royal Italian Opera in Covent Garden, I had access whenever the orders were not appropriated by Mrs. Wilson, who, as wife of the proprietor and editor, had of course the first claim. Most of the performances did not greatly attract me. I cared but little for operatic

representations of personal passion only, however graceful the music. Even *Don Giovanni* failed to please me much. A string of pretty airs and duets, even when supported by fine orchestration, did not fulfil my conception of an Opera. It seemed to me that there is required in all cases a basis of popular passion. The feelings excited during revolutions and religious enthusiasms, spontaneously vent themselves in songs, alike of individuals and of crowds. Hence something like dramatic propriety is given to an Opera which has for its leading theme the incidents of a social convulsion; and, while under the excitement produced by adequate musical rendering of popular passions, one can overlook minor incongruities. The following passage in a letter to Lott, expressed the conception I then had, and still have.

"Above all other operatic composers Meyerbeer is dramatic. He really knows what an opera ought to be. He subordinates everything to the characters, the emotion, and the sentiment, and does not intersperse his music with pretty little songs and duets that have no relation to the action. Massiveness, too, is one of his great characteristics. An opera of his does not give you the idea of a good thing drawn out thin, as most of them do—and then he is highly original. Altogether I may say that I never was satisfied with an opera till I heard The Huguenots."

Friends with whom I have been constantly at issue on this point, have insisted upon judging of operatic composers by the standard of their music, considered simply as music; but I have always contended that the first thing to be achieved is dramatic truth, and that the promptings of melodic inspiration must be subordinated to it. This, I believe, is the doctrine of Wagner. But so far as I have heard, his practice does not conform to his theory: he sacrifices the melodic without achieving the dramatic.

At Midsummer 1849, a new element was added to my life by the migration of my uncle Thomas to London. After some two years in Bath, he decided that his labours for public welfare would be more effective here than else-

where, and he eventually took a house in St. James's Square, Notting Hill.

His was one of those natures which are improved by misfortune. The loss of a large part of his property in the way already described, had beneficially changed some of his opinions and feelings. Throughout life, up to the time of this great disaster, he had been a successful man; and had owed his success to his own efforts and to his prudence. The result was an almost unqualified belief that energy and rectitude will insure prosperity to everyone. He was now undeceived. Clear proof was given to him that there are other causes for good or ill fortune than good or ill conduct. A marked change of attitude was the consequence—a great increase of fellow-feeling; and a striking effect was produced on his preaching. In earlier days his sermons might have been well characterized by the words which the old Scotchwoman applied to ethical sermons in general—they were distinguished by "cauld morality." But though in these later days his sermons, I doubt not (for I never then heard him), continued to be moral rather than theological, their morality was warmed by sympathy. The consequence was that he became a very effective preacher. While at Hinton, he rarely drew any auditors from adjacent parishes; but now when, as frequently happened, he supplied for a time the places of absent provincial clergymen, his preaching quickly gathered immense congregations from many miles around.

Our relation had for many years been cordial, and now became still more cordial; as did also my relation with my aunt. Having had so much to do with my education, and having no children of his own, my uncle had, I think, acquired a semi-paternal feeling for me; and my liking for him had gradually increased during years in which my relative position had been one of independence and not one of subordination. His migration to London consequently led to constant intercourse. It became an established habit for

me to spend Sunday evenings with them—at first every other Sunday, and afterwards every Sunday; and the meetings were looked forward to with pleasure on both sides.

The topics we discussed were not numerous. The arts and most of the sciences had no attractions for my uncle; but on subjects interesting to both—ethics, politics, education, and social affairs generally—there was a general agreement between us. The Spencer character came out in prompting kindred views. Even where we differed, our differences were amicable. Never having been narrow, he became in his later life increasingly broad-minded and tolerant. This was strikingly shown when, on three successive Sunday evenings, we continued a debate concerning the validity of the belief in a personal God. The position I took is well expressed in a letter to my father written shortly afterwards, an extract from which runs as follows :—

"Mr. Mason states correctly the substance of our conversation. And I still hold that the question is one about which no positive conclusion can be come to. I hold that we are as utterly incompetent to understand the ultimate nature of things, or origin of them, as the deaf man is to understand sound or the blind man light. My position is simply that I know nothing about it, and never can know anything about it, and must be content in my ignorance. I deny nothing and I affirm nothing, and to any one who says that the current theory *is not* true I say just as I say to those who assert its truth—you have no evidence. Either alternative leaves us in inextricable difficulties. An *uncaused* Deity is just as inconceivable as an *uncaused* Universe. If the existence of matter from all eternity is incomprehensible, the creation of matter out of nothing is equally incomprehensible. Thus finding that either attempt to conceive the origin of things is futile, I am content to leave the question unsettled as *the insoluble mystery* . . . . I have lately had several conversations on this matter with my uncle, and have been pleased with his liberality of treatment."

As I had not seen Mr. Mason (a dissenting minister of Derby) since 1848, it follows that at the age of 28 I had reached a quite definite form of that conviction set forth twelve years later in *First Principles*.

My enjoyment of these Sunday evenings at Notting

Hill, was in part due to the circumstance that my social circle still continued to be small. It naturally did so; for I took no steps to extend it. I dare say my pride would have stood in the way had it occurred to me to take any such steps; and even had I taken them, there would, I suspect, have been but small success. Being critical, and having but little reticence, my natural tendency is towards the expression of disagreement rather than towards the expression of agreement. And of course the habitual display of this tendency is apt to leave an unfavourable impression.

Save when with old engineering friends, and on evenings now and then spent with my coadjutor Mr. Hodgskin, who wrote the reviews and a good part of the leading articles for *The Economist*, my only opportunities of meeting strangers occurred at the house of Mr. Chapman (afterwards Dr. Chapman) to whose evening parties I had already been once or twice while he lived at Clapton; and who had now transferred his publishing business from Newgate Street to a large establishment in the Strand, nearly opposite *The Economist* office. Here he gave weekly *soirées*, which I from time to time attended. Among many not known to fame, there were some who had made reputations which proved but temporary and some who have made more permanent reputations. Of ladies may be named Miss Anna Swanwick, Miss Bessie Parkes, then known as the author of a volume of poems, Miss Eliza Lynn, now Mrs. Lynn-Linton, and I think occasionally Madame Bodichon, at that time Miss Leigh Smith. Then among the gentlemen was Mr. John Oxenford, well known in those days as theatrical critic to the *Times*, writer or adapter of light dramas, and reader of German philosophy. It was at one of these gatherings I first met Mr. Froude, who had recently published with Chapman his *Nemesis of Faith*, and then bore on his melancholy face the impress of that book. Another

notability was Mr. Francis W. Newman, who a little later published his *Phases of Faith*. His very gentle manner suggested an angelic sweetness of nature; but if conversation passed into discussion, it soon appeared that he could become peppery enough. Beyond these and others I do not recall, there were not unfrequently Americans of mark; for Chapman had to utilize his vast house by taking in boarders, and had formed an American connexion. Emerson took up his abode there during one of his visits to England, but I did not then see him. There came, too, Horace Greeley, editor of the *New York Tribune*, at that time a man of much influence.

It was here that, in the spring of 1850, I first met Mr. G. H. Lewes. We happened to leave the house at the same time; and, discovering that we were going in the same direction, we walked together, and talked—I doubt not in an animated way enough. One of our topics was the development hypothesis; and I remember surprising Mr. Lewes by rejecting the interpretation set forth in the *Vestiges of the Natural History of Creation*: he having supposed that that was the only interpretation. From this walk dated an acquaintance which a year later was renewed, and presently became an intimacy.

Under the arrangement made with Mr. Wilson, I had the option of occupying rooms at *The Economist* office, 340 Strand; and during the earlier part of my journalistic life, I did occupy them. Of course the habitat was trying to me—accustomed as I had been to a quiet house and tolerably good air. I see from letters that notwithstanding double sashes to the windows, it took me a week to become so far inured to the eternal rattle of the Strand as to be able to sleep; and I see, too, that for some time I suffered in general health from noise and other causes. Though in the subsequent April I described myself as having become

tolerably well acclimatized, yet the insalubrity evidently told upon me. Hence a change in the spring of 1850. A letter to my father dated 18 April says :—

"Since I wrote last I have made a revolution in my domestic arrangements. I have been for some time past finding that I was beginning to suffer considerably in health from living in the close atmosphere of the office; more especially since that atmosphere had become much more offensive than hitherto, in consequence of the drains having got out of order. Having at length caught cold three times within two months, I thought it was time to make some change."

The change referred to was the taking of rooms near Westbourne Grove—a place that then corresponded to its name: an avenue of trees, on each side of which stood detached cottages in gardens. Clusters of flower-beds before the doors characterized the terrace in which I lodged; and now this has budded-out the ground-floors of its houses into shops. The letter goes on to name a further revolution in habits.

"You will perhaps be surprised to hear that I have at the same time turned vegetarian. Following the example of Loch (who has been a vegetarian for these five months) Jackson has been trying the system for this month past, and finds himself greatly improved in health . . . . I feel quite well with it, and, as I have said, improved. But of course much of the improvement is due to the change of air."

To which cause I should have added the daily walks into town and out again. Describing the effects of the new regimen, a letter to my mother, dated May 6, says—

"As I have felt no inconvenience during these first few weeks, I do not suppose I shall now do so. I think I have felt the cold more keenly than I should otherwise have done, and I find others who are trying the experiment make the same complaint. I believe, however, that this result is merely temporary. Meantime I am in all respects well and strong."

From the phrasing of these statements it is clear that I was willing to persist in vegetarianism, had I been encouraged to do so by further results. My scepticism was first aroused, however, by the fact that after six months' abstinence from animal food, our friend Loch gave evidence of a lowered condition. His voice had become extremely mild and feeble, and he had partially lost power over one of his feet in walking. Writing, as it seems from my father's dating,

towards the close of May (for I had not dated the letter myself), I said—"I have about decided to give up the vegetarianism, at any rate for the present. I think this relaxation under the eyes is due to it." The clearest evidence, however, that I had been suffering, was disclosed afterwards. I found that I had to re-write what I had written during the time I was a vegetarian, because it was so wanting in vigour.

Here, as I shall not have a fitter opportunity for naming it, I may add, concerning place of residence, that after returning some months later to the Strand, and spending the rest of the year there, I went for a short time to St. George's Place, Kentish Town, and thence migrated to No. 20 Clifton Road, St. John's Wood, which continued to be my abode during the remainder of my engagement with *The Economist*.

What was the tenor of my intellectual life in those days? Did I trust to memory only, I should reply that I read nothing but newspapers and periodicals—not even reading novels, much less any serious books. Reference to correspondence, however, has undeceived me. One letter to Lott names *The Caxtons* and *Strathmore* as having been read; and another, commenting on *Pendennis*, ranks it above *Vanity Fair* because "there is less satire and more sympathy in it." A subsequent paragraph praises a novel then recently published by Mrs. Gaskell.

"And now whilst I think of it let me ask whether you have read "Mary Barton." If you have not, do by all means. It affords some very good discipline. I cannot say that it is at all an agreeable book to read. It is on the contrary a very painful one. In fact at one part of it I got quite angry with the authoress (for authoress I hear it is) for torturing my feelings so needlessly. However it is a very instructive book and one that everyone should read."

As my memory has failed me in respect to light literature, it very possibly, or even probably, has done so in respect to graver literature; and I may have given attention to some

serious books in 1849 and 50, though I do not remember it. One only which I looked into, left an impression. This was Coleridge's *Idea of Life;* the substance of which he was said to have borrowed from Schelling. The doctrine of individuation struck me; and, as was presently shown, entered as a factor into my thinking.

How it happened that I read so little I scarcely know. It may have been that my leisure was mainly occupied with thinking; for I had a good deal to think about, and thinking was always with me more pleasurable than either reading or doing. Or it may have been in part that few beyond ephemeral books came in my way; for I did not then subscribe to Mudie's library or any other.

It is true that there came to *The Economist,* books for review (not many, however, for *The Economist* had but small space for literary criticisms); and into these I occasionally dipped before they went to Mr. Hodgskin. Of one only have I any remembrance; and that because of the adverse impression it produced. When, some years before, there had appeared *Modern Painters* by Mr. Ruskin, I was delighted to find in him one who dared to express unfavourable opinions about some of Raphael's works; for then as always I stood alone in insisting on the various faults of these, as of most other paintings by the old masters. Naturally, therefore, when there came to *The Economist* his just-issued *Stones of Venice,* I opened it with raised expectations. On looking at the illustrations, however, and reading the adjacent text, I presently found myself called upon to admire a piece of work which seemed to me sheer barbarism. My faith in Mr. Ruskin's judgment was at once destroyed; and thereafter I paid no further attention to his writings than was implied by reading portions quoted in reviews or elsewhere. These, joined with current statements about his sayings and doings, sufficiently justified the opinion I had formed. Doubtless he has a fine style, writes passages of great eloquence, and here and there expresses truths;

but that one who has written and uttered such multitudinous absurdities should have acquired so great an influence, is to me both surprising and disheartening.

If, as this reference to Mr. Ruskin suggests, the æsthetic should be here joined with the intellectual, I may fitly quote a passage from a letter bearing upon it.

"Mentioning Loch's name reminds me that we have had several very pleasant botanizing excursions lately. Loch commenced the study in the spring, and during our occasional walks when I called upon him, I found that all my interest in it had died away. By and bye, however, it began to revive; and of late I have enjoyed it as much as he has. We have generally chosen Sundays for our trips into the country, and have returned much the better for them in all respects. One fact in connexion with this matter has pleased me much. You may probably have remarked that I have been seemingly deficient in the admiration for flowers which most have; and, indeed, I think I have confessed in your presence that they do not yield to me that amount of pleasure which, considering my perceptions of beauty in colour and form are pretty active, they ought to do. Well, whether it be this botanizing or not I do not know, but I have, within this month or two, remarked a very marked increase in my appreciation of floral beauty; so that to-day as I walked along the flower-walk in Kensington Gardens, I found myself perpetually tempted to linger by the admiration of beauties and graces that had never excited me before to anything like the same extent."

About the interpretation here suggested I am very doubtful; for, certainly, intellectual analysis is at variance with æsthetic appreciation. This was clearly proved to me in the case of flowers at the time when I was studying them in relation to the laws of organic form.

The several sections of this chapter, though some of them referring to particular times, must be understood as generally referring to the period over which my journalistic life extended. In them I have aimed to represent my daily routine, and the average incidents which the months and years brought me. They must be regarded as constituting the background to more special doings and occurrences.

To such more special doings and occurrences the four chapters which follow are devoted.

CHAPTER XXV.

MY FIRST BOOK.

1848—50. Æt. 28—30.

The offspring of the mind, like the offspring of the body, are apt to become objects of engrossing interest to which all other objects are subordinated. A striking illustration of this was furnished by me early in 1849, as I was taking my morning walk in St. James's Park. The weather was frosty; and, having a bad cold, I was coughing violently. Abrasion of a small superficial blood-vessel produced some appearances which I, little the better it seems for such medical knowledge as I possessed, absurdly interpreted into spitting of blood, and at once inferred that I was doomed. As I walked on in saddened mood, my first thought was—"It will be a pity if I can't finish my book first."

After writing the above paragraph, and after remembering that the book, commenced early in the autumn of 1848, was not finished till Midsummer 1850, I was about to remark that, considering the degree of interest I felt in the undertaking, it is strange that I should have been so dilatory in executing it. Reference to correspondence, however, proves that my lack of energy was not so great as I supposed. A letter sent home early in 1849 says—

"I cannot say that I make satisfactory progress with my book. From one cause or another I meet with so many interruptions that I do not spend half the time at it that I wished and intended to do. One cause of this is that I feel it necessary to take what out-door relaxation I can get during my leisure days, lest my health should break down."

A letter to my father in December, shows that in pursuance

of a wish to issue the book during the next publishing season I was working hard.

"They tell me I am looking very well—much better than I was some months ago. So that, considering that I am at work until 12 o'clock every night and on Fridays till about 2, I think I may rather brag."

Having for more than thirty years been unable to work late in the day without losing the whole of such rest as a night brings me, I have become so accustomed to associate the two as cause and effect, that it seems strange to me that anyone should be able to write at night and sleep afterwards; and it seems to me almost incredible that I could at one time do so myself. Even then, however, an injurious effect resulted after a time.

"I have already commenced revising, which I am doing after dinner and in the evening, in consequence of finding that much writing at night was making me sleepless. And I have been getting up early (sometimes at 5) to do the new writing; but I do not know how long it will last."

Thus it appears that, especially when getting within sight of the goal, I did not consult my ease quite so much as I thought.

In some measure the slowness of my progress was due to the labour I spent over the composition. Somewhere I had met with the saying that a book is saved by its style; and had taken the saying to heart. Probably it would have influenced me but little had I not been constitutionally fastidious. But having in most things a high ideal, and being by nature prone to look for faults, alike in the performances of others and in my own, I was commonly not satisfied by the first expressions which suggested themselves; and never rested so long as I thought that a sentence might be made clearer or more forcible.

Moreover I had some years before been led to make style a subject of study, and had embodied the general conclusions reached in an essay on Force of Expression; so that both by mental proclivity and by preparation I was prompted to be critical. Of every later book the original

manuscript, sprinkled with erasures and interlineations, has been sent to the press; but the original manuscript of this first book, after revising it with care, I copied, and then, when the time for publication was approaching, revised the copy: making, as a letter says, "some ten or a dozen erasures per page," "even in the first parts which I wrote so very carefully." And here, for the sake of a remark it suggests, let me quote a sentence from a letter written while the latter part of the volume was in progress.

"I have lately been less particular than heretofore; and I have adopted this course in consequence of finding that the imperfections that it costs much thought and trouble to rectify at the time of writing, become visible enough and easily amended after the lapse of some time."

This, which is a familiar experience from ancient days down to ours, implies a curious analogy between the workings of the intellect and the workings of the emotions. That during emotional excitement it is difficult to see where the right lies, while, after an interval, it becomes comparatively easy, and after the lapse of years we feel surprised at having failed to recognize an obvious fault of conduct, is a fact observed by most. And here it is observable that in like manner, the flaws in our intellectual processes as embodied in words, are difficult to perceive during the heat of production, but become conspicuous when the currents of thought have for a long time left them.

Let me add another remark concerning erroneous estimates, now too favourable, now too unfavourable, of our mental products, as of other things with which we are identified. The diversities of judgment consequent on permanent diversities of physical constitution, as well as those consequent on temporary diversities of bodily state, are not sufficiently recognized; or not recognized to sufficient purpose. I was told by a friend that during a long period of ill-health, accompanied by depression so great that he felt strongly inclined to commit suicide, he was fully aware that his gloomy thoughts and forebodings of disaster were results of physical derangement; and

yet this knowledge did not enable him to expel them: his judgments were perverted in spite of himself. Perversions less extreme are common, and, indeed, occur in all people: here being habitual and there occasional. In some matters of perception, each man's "personal equation," once ascertained, makes it easy to correct the errors of his observations; but, unfortunately, we have no means of establishing personal equations for the correction of judgments. These reflections are suggested by remembrance of the varying opinions I formed of my work during its progress. Now I took up a chapter written sometime before, and, after reading it, said to myself—"Good: that will do very well;" and then, in another mood, I re-read the same chapter, and laid it down discontentedly with the thought that the argument was not well put, or that the expression lacked vigour.

On the whole, however, I was tolerably well satisfied; and sometimes looked forward to the day of issue with raised expectations.

Early in the Spring of 1850, when completion of the work was within sight, there arose the question,—How to get it published? At that time I was, and have since remained, one of those classed by Dr. Johnson as fools—one whose motive in writing books was not, and never has been, that of making money. The thought that I might profit pecuniarily, never even occurred to me—still less served as a prompting thought. To get the work printed and circulated without loss, was as much as I hoped; but how to do this?

The difficulties were great; and as indication of them may be instructive to literary aspirants, and especially to those whose ambitions lie in the direction of serious literature, I here give some relevant extracts from letters to my father. They were written in the latter part of March.

"I have made an appointment with Chapman for Saturday morning, when I am to read him part of the manuscript. Judging from the attitude he

takes, I e here will be considerable difficulty in getting the book published. He speaks of his position as being such that he dare not speculate; and that the question would turn more upon the degree of dependence he could place upon my ability to meet the cost, supposing the book should not pay. He says, moreover, that from his past experience of philosophical books, it is probable that the more highly he thought of it the less hopeful he should be of its success."

The following is from a letter sent a few days later.

"I had a long talk with Chapman this morning and on the whole a favourable one. It has been all along understood that the publication was to be on my own responsibility: the only question with Chapman being to what extent it would be safe to give me credit. He says that he is himself so short of capital, that were he the only party concerned he should be obliged to decline; seeing that he dare not run the risk of having to lie out of his capital that length of time that it might take me to pay the deficiency, if the work should not succeed. He says, however, that his friend Woodfall (with whom I think I told you he was in the habit of making such arrangements) would agree, if Chapman thought I might be trusted, to give me two years' credit. And Chapman, seeing the probability of my railway claims being settled before the expiration of the term, and seeing, further, that I should be able to lay by some considerable sum out of my salary between this time and that, seems inclined to recommend him to do this."

The Mr. Woodfall referred to in this extract (a descendant of the Woodfall of political celebrity) took an interest in Chapman's business as a channel for liberal thought. Doing, as he did, much of Chapman's printing, he sometimes entered into joint responsibilities; and he willingly listened to the suggested arrangement. The railway-claims referred to, enabled me to give him something like a guarantee. Since 1845, one of the companies by which I had been then employed had owed me £80; and I took Mr. Woodfall to the office of the official liquidator under the winding-up act, for the purpose of verifying my statement that such a sum was due. The agreement was then made and the printing proceeded.

The moral of these facts is that in the absence of a sympathetic printer, and a sympathetic publisher (for Chapman was anxious to bring out the book), and in the absence of this partial security I was enabled to give, the book would not have been issued at all; or, at any rate, would have remained

unissued for years, waiting until I had accumulated a sufficient sum to meet the cost.

I am greatly indebted to my father for preserving everything written; even where no probable use for it could be assigned. Much correspondence which might reasonably have been regarded as valueless, has proved useful; and some letters from me to him at this time, serve a purpose which neither he nor I could have imagined when they were sent and received. They concern the title of the book, which was being discussed while the negotiations about printing were going on. The following extracts I give for a reason which will presently be manifest.

Let me premise that anyone who glances at its contents will see that the aims of the work are primarily ethical. Its introduction discusses the doctrines of different schools of moralists; its first part seeks to deduce men's rights from a fundamental law of equity; and its remaining parts draw corollaries concerning equitable political arrangements: enforcing the ethical deductions by considerations of expediency. My own conception of it was expressed by the following sentence contained in a letter written in March.

"The Title is to be—'A System of Social and Political Morality.'"

In a letter of mine which my father has dated May (he frequently added dates when I had omitted them) there occur these paragraphs:—

"I am rather undecided as to the title of my book. Peppé, whom I think I have mentioned to you, says that a friend of his to whom he happened to mention the title, quite agreed with him in thinking it was not one that would attract attention; but that people would rather feel inclined to pass it over as suggesting a threadbare subject. He quite approved of the term *Demostatics*, which I told him I had used in the introduction, but had felt fearful of using for a title lest it should be thought pedantic. My uncle, with whom I was talking over the matter last night, seems also to like the word, and advises me to take the opinions of as many as I can place confidence in. The word is perfectly appropriate as describing the special nature of the book; and is also suggestive of its strictly scientific

character. The only objection is, that it might give a handle to ill-natured criticisms.

"I have also thought of the expression—*Social Statics;* but my uncle objects to this that it would be taken by many people for social *statistics.* Of course to either of these I should append the title I have already chosen, by way of explanation."

And then on August 7, after the printing had made considerable progress, I wrote to my father—

"Neither Chapman nor Mr. Hodgskin approves of *Demostatics* as a title. They both think that more would be prejudiced against the book by it than would be impressed in its favour.

"Mr. Hodgskin quite approves of *Social Statics,* which he thinks would be a very good title. I am going to consult with Chapman about it. What is your objection to it? As I am now thinking of it the title would stand—

Social Statics: a System of Equity Synthetically Developed."

Three things are, I think, thus made manifest. First, that the work was conceived by me, and had continued up to the time of its completion to be regarded by me, as "A System of Social and Political Morality." Second, that the word *Demostatics,* already used in the introduction (erased before printing) was the word to which I leaned as a leading title, when the original title was objected to: my intention being to suggest what I considered the subject-matter of the book—how an aggregate of citizens may stand without tendency to conflict and disruption—how men's relations may be kept in a balanced state: my belief being that the conforming of social arrangements to the law of equal freedom, or to the system of equity deducible from it, insured the maintenance of equilibrium. And third, that the title *Social Statics,* thought of as an alternative suggesting the same general idea, was used by me only because I was dissuaded from using the title *Demostatics,* as I had previously been dissuaded from using the original title.

It was unfortunate that I then knew nothing more of Auguste Comte, than that he was a French philosopher—did not even know that he had promulgated a system having a distinctive title, still less that one of its divisions was called "Social Statics." Had I known this, and had I in con-

sequence adhered to my original title, it would never have entered any one's head to suppose a relation between M. Comte and myself: so utterly different in nature is that which I called "A System of Social and Political Morality" from that which M. Comte called "Social Statics"; and so profoundly opposed are our avowed or implied ideals of human life and human progress.

I cannot now recall the feelings with which I glanced through the papers in search of a review. Impatience, I dare say, was the dominant feeling; for the notice of a grave work by an unknown author, was certain to be long delayed. Nor can I remember whether, when reviews at length came, I was disappointed by their superficial character. No analytical account of the book appeared; and, as usual with books of the kind, readers were left to find out its nature for themselves. In the absence of one, let me here sketch out such a review as might have been written by a competent critic who had read *Social Statics* through, and given due thought to its arguments.

Nothing in this volume implies that its author accepts the current creed; and though a chapter entitled "The Divine Idea" implies that he is a theist, yet, for anything that appears to the contrary, his theism is nominal only. Immediate divine interposition nowhere enters as a factor into his conception of things; but, contrariwise, things, human as well as other, are conceived as conforming everywhere and always to immutable law. Such being the case, it seems to us that merely putting at the back of immutable law a divine idea, practically amounts to nothing: the immutable law might stand just as well by itself.

Social Statics, or, to quote its sub-title, *The Conditions essential to Human Happiness specified, and the first of them developed*, might fitly be characterized as a kind of Natural-History ethics. Its sub-title shows that, assuming happiness as the end to be achieved, it regards achievement of it as dependent on fulfilment of conditions; conformity to which constitutes morality. It considers Man as an organized being subject to the laws of life at large, and considers him as forced by increase of numbers into a social state which necessitates certain limitations to the actions by which he carries on his life; and a cardinal doctrine, much emphasized by Mr. Spencer, is that Man has been, and is, undergoing modifications of nature which fit him for the social state, by making conformity to these conditions spon-

taneous. In a chapter entitled "The Evanescence of Evil," he exemplifies the truth that increased use of any power, bodily or mental, is followed by increased strength of it; and conversely. He argues that the implied adaptation of constitution to requirements goes on without limit; and that therefore, in course of time, the adaptation of human nature to the social state will become complete—man will become perfect. Here is one illustration among many of Mr. Spencer's too-little-qualified conclusions. We will not enlarge on the fact which he should have recognized, that as fast as adaptation approaches completeness, it becomes slower and slower—that the forces which produce change become less as the need for change diminishes; so that adaptation must ever remain incomplete. Merely noting this, we go on to point out that, for adaptation to become complete, the conditions must remain constant; which they do not. Astronomic and geologic changes must cause in the future, as they have caused in the past, unceasing alterations in the climatic and other characters of men's habitats; entailing slow migrations of races from regions which have become unfit to fitter regions. Along with such migrations must go modified habits of life, and of industrial arrangements. So that before adaptation to any one set of conditions has been approached, some other set of conditions will have to be met.

Passing now to the ethical part of his theory, we find Mr. Spencer's first proposition to be that every man is free to do whatsoever he wills provided he does not infringe the equal freedom of any other man—free to do it, that is, in the sense that within this limit, other men have no right to restrain him. This is said to be the primary condition to which men's actions must conform before social life can be harmonious. But Mr. Spencer does not say what he means by men—How about children? If the law is not applicable to them, are they to be regarded in old Roman fashion, as property over which the parent has life-and-death power? If, contrariwise, the law is applicable to them, must they be considered as having the same claims to freedom as their fathers, including political freedom? Clearly Mr. Spencer should at least have limited his doctrine to adults.

After making this needful qualification, we may accept the conclusion that men's claims to life, to personal liberty, to property, to free speech, &c., &c., are corollaries from this first principle: all forms of equity, or equalness, being implied in it. Passing over some chapters in which these corollaries are drawn, we come upon one which again shows our author's way of pushing his doctrines to extremes, without regarding the limitations necessitated by social conditions. We refer to the chapter on "The Rights of Women." Setting out with the assertion that "equity knows no difference of sex," he argues that the rights previously deduced must be as fully recognized in women as in men; and presently coming face to face with the question of political rights, he boldly claims these as much for the one as for the other. Now as a matter of equity simply, this claim might be valid were the social positions of men and women alike in every other respect. But they are not,

Just noting that certain privileges which men accord to women constitute a kind of social priority, it will suffice to emphasize the fact that along with their citizenship, men have the obligation of defending the country, while women have no such obligation. To give women the same political power as men without joining to it his onerous political duty, would be to give them not equality but supremacy. Only if, while receiving votes, they undertook to furnish to the Army and Navy contingents equal to those which men furnish, could they be said to be politically equal.

In Part III. of his work, Mr. Spencer treats at length of those political applications of his first principle incidentally touched upon in the last paragraph; and here we shortly come upon the strangest and most indefensible doctrine in the book. Unquestionably Mr. Spencer has "the courage of his opinions;" for, in a chapter entitled "The Right to Ignore the State," he actually contends that the citizen may properly refuse to pay taxes, if at the same time he surrenders the advantages which State-aid and State-protection yield him! But how can he surrender them? In whatever way he maintains himself, he must make use of sundry appliances which are indirectly due to governmental organization; and he cannot avoid benefiting by the social order which government maintains. Even if he lives on a moor and makes shoes, he cannot sell his goods or buy the things he wants, without using the road to the neighbouring town, and profiting by the paving and perhaps the lighting when he gets there. And though he may say he does not want police-guardianship, yet, in keeping down footpads and burglars, the police necessarily protect him whether he asks them or not. Surely it is manifest—as indeed Mr. Spencer himself elsewhere implies—that the citizen is so entangled in the organization of his society, that he can neither escape the evils nor relinquish the benefits which come to him from it.

Concerning the succeeding chapter on "The Constitution of the State," little need be said. In these days of extended franchise and agitations for wider extension of it, Mr. Spencer will find general agreement in his argument deducing the constitution of the State from the law of equal freedom. Nor need the chapter on "The Duty of the State" detain us, further than to remark that we wish we could see some sign that the State will presently give to each citizen that complete protection against civil, as well as criminal, injuries, which payment of taxes entitles him to. But the next chapter—"The Limit of State Duty"—introduces another of Mr. Spencer's peculiar views, which most readers will promptly reject. In it he contends that beyond its function of protector against external and internal enemies, the State has no function; and that when it assumes any other function it becomes an aggressor instead of a protector—partly by unduly restricting men's spheres of action, and partly by taking away their money to support its additional staffs of officials. The remainder of Part III. is devoted to discussing the various forms of legislative aggression, in chapters on "The Regulation of Commerce," "Religious Establishments," "Poor Laws,"

"National Education," "Government Colonization," "Sanitary Supervision" &c., &c. Each of these chapters begins by deducing from the law of equal freedom, the inequity of the particular kind of State-action treated of; and then proceeds to shew the impolicy of such kind of State-action. The conclusions set forth in the first two of these chapters, are conclusions already drawn by many people. Those set forth in the others will be variously regarded—mostly with repugnance. For ourselves we may confess to feeling some sympathy with Mr. Spencer in his protests against the multitudinous mischiefs done by legislation; and think that politicians would do well to inquire more carefully and sceptically than they do, before proposing new regulations. In defending some of his theses, however, Mr. Spencer enunciates doctrines which will horrify many soft-hearted people. Describing (on p. 322) the ways in which among animals the destroying agencies at work, continually "weed out the sickly, the malformed, and the least fleet or powerful," and saying that by this and kindred processes "all vitiation of the race through the multiplication of its inferior samples is prevented," Mr. Spencer goes on to argue that mankind are, and should be, subjected to this "same beneficent, though severe discipline"; and he holds that when a Government tries to prevent the misery necessitated by the stress of competition and the consequent "struggle for life or death," it eventually creates far more misery by fostering the incapables: saying of the "spurious philanthropists" that "these sigh-wise and groan-foolish people bequeath to posterity a continually increasing curse." So, again, on pp. 378-81, he asserts that "inconvenience, suffering, and death, are the penalties attached by nature to ignorance, as well as to incompetence;" and contends that the State does mischief when it wards off such penalties. Verily this teaching is not meat for babes but for men; and men of strong digestions, too. However, it is needful to add that Mr. Spencer protests only against interference by the State with the normal connexion between suffering and inferiority: saying, of the natural expurgation of society ever going on, that, "in so far as the severity of this process is mitigated by the spontaneous sympathy of men for each other, it is proper that it should be mitigated."

Part IV. we must pass over; though the chapter entitled "General Considerations" contains matter for comment—mostly approving but partly dissentient. Already points of dissent have been sufficiently emphasized—perhaps obscuring too much sundry points of agreement of greater importance. We do not deny that, for harmonious social co-operation, there must be recognized the liberty of each limited only by the like liberty of all: the further limitations which morality dictates, not being properly imposed by public agency. That those various claims which we distinguish as "rights" are corollaries from this fundamental requirement, seems also to be a well-grounded proposition. Moreover, the arrangements implied by political justice are deduced by Mr. Spencer from the first principle he lays down, by arguments which seem to us mostly valid. Nor are we concerned to dispute the inference, that when the State undertakes to regulate and aid

men in the carrying on of their lives, it inevitably diminishes their liberties, by controlling either their actions or their purses; while, unquestionably in many cases, it does evil rather than good by its officious meddlings. Though, as pointed out, the absolutely optimistic belief in the perfect adaptation of men to the social state, is untenable, yet there is reason for thinking that an approximate adaptation is being slowly effected. And there may be warrant for the doctrine set forth in a curious section of the "General Considerations," where, saying that we often "speak of the body politic" and "compare a nation to a living organism" (being led, by this collocation of ideas, to use the strange phrase "the social organism"), Mr. Spencer argues that there is going on a conciliation between the structure of society and the structures of its units—an action and reaction by which the two are being ever moulded and re-moulded into congruity; so that eventually man will acquire a nature such that he will tend to do spontaneously that which the welfare of society demands.

It is a pity that Mr. Spencer did not devote some years more of thought to his work before publishing it. He might then have set forth the truths it contains freed from the crude ideas with which they are now mingled, and undisfigured by illegitimate corollaries.

Little to be expected, a criticism of this kind, serving really to enlighten readers concerning the nature of the work, nowhere appeared. The usual purposes of a reviewer are—first, to get his guineas with the least expenditure of labour; second, to show what a clever fellow he is—how much more he knows about the matter than the author; third, to write an amusing article; fourth, to give some account of the book: which last purpose, often practically unattempted, is rarely fulfilled. It may, indeed, be said in the critic's defence that, did he bestow on each book as much time and thought as would be requisite for giving a satisfactory delineation and estimate, he could not get bread and cheese at the work.

It must not be supposed, however, that I had any reason to be dissatisfied with the reception given to *Social Statics*: judging the reception by the ordinary standards. On the contrary, the book gained more attention than was to be expected. The following extract from a letter shows that I was quite content with the treatment accorded to me.

"With the exception of the *Daily News* wet blanket, I have so far had nothing but sunshine. Indeed I am somewhat surprised at meeting with so

little rough usage. I expected that some of the expediency-school would have pitched into me savagely. But probably I may still come in for a taste of abuse."

Let me add, as being noteworthy, that *Social Statics* was more extensively, as well as more favourably, noticed, than any one of my later books: a fact well illustrating the worth of current criticism.

Naturally some social effect resulted from this measure of success—an effect, however, which, with my habitual want of tact, I took but little advantage of. One incident connected with the social effect is described in a letter to Lott. Here is the passage:—

"I doubt not you would have greatly enjoyed being a party to the *badinage* that has been carried on at my expense by Chapman and Miss Evans (the translatress of Strauss) for these two months past. They have taken upon themselves to choose me a wife; and the various arrangements and delays in effecting an introduction have, as you may suppose, afforded subject-matter for much mirth. The affair was put into their heads by the inquiry the young lady made as to the authorship of "Social Statics"—whether Herbert Spencer was a real or an assumed name &c. &c. So on the strength of the lady's admiration for the book, and all other circumstances seeming as they thought suitable, I was startled by the information that they had found a wife for me. Some fortnight or three weeks ago the introduction took place. I cannot say that my inclinations at all indorsed their theory. My objection —at least the chief one—is a somewhat unusual one. The young lady is in my opinion too highly intellectual; or I should rather say—morbidly intellectual. A small brain in a state of intense activity, is the best description. Moreover she seems pretty nearly as combative as I am; and has, I fancy, almost as much self-esteem. Moreover she did not seem as if she could laugh. So that though she is sufficiently good-looking, young, extremely open, a poetess and an heiress, I do not think that the spirit will move me."

As I learned afterwards, the lady, too, was not favourably impressed. Probably she came with high anticipations and was disappointed: looking for intellectual coruscations and meeting with nothing but common-place remarks. Most people frame very untrue, and often very absurd, conceptions of those who write books. They expect to find them differ from average persons in conspicuous ways. One may say that as a rule no man is equal to his book;

though there are, I believe, exceptions. All the best products of his mental activity he puts into his book; where they are separated from the mass of inferior products with which they are mingled in his daily talk. And yet the usual supposition is that the unselected thoughts will be as good as the selected thoughts. It would be about as reasonable to suppose that the fermented wort of the distiller will be found of like quality with the spirit distilled from it.

Nor is it only in respect of intellectual manifestations that too much is looked for from authors. There are also looked for, especially from authors of philosophical books, traits of character greatly transcending ordinary ones. The common anticipation is that they are likely to display contempt for things which please the majority of people. This remark is suggested, not by anything which occurred in 1851 or thereabout, but by incidents of some thirty years later, of which I am reminded by the incident narrated above. These, though out of place in respect of date, I may perhaps better set down here than elsewhere. One concerns a Frenchman who, anxious to see me, came to the Athenæum Club, and was brought by a member to the billiard room as the place where, in the afternoon, I was most likely to be found. Here he saw me engaged in a game; and, as I heard afterwards, lifted up his hands with an exclamation to the effect that had he not seen it he could not have believed it. The other concerns the American millionaire, Mr. Andrew Carnegie, who in August, 1882, returning to America by the *Servia* in which I was going, brought a letter of introduction to me; and who afterwards told me how greatly astonished he was during our first meal on board to hear me say—"Waiter, I did not ask for Cheshire; I asked for Cheddar." To think that a philosopher should be so fastidious about his cheese!

The identification of philosophy with stoicism still prevails very generally, and continually crops up in unexpected ways and places.

CHAPTER XXVI.

AN IDLE YEAR.

1850—51. Æt. 30—31.

Sometime in the spring of 1851, when dining in company with him at Mr. Wilson's, I was congratulated by Mr. W. R. Greg on the success of *Social Statics;* and thereupon greatly surprised him by the remark that after all, the result achieved seemed scarcely worth the trouble of achieving it. Had there been reason for dissatisfaction with the reception given to the book, such a feeling would not have been unnatural; but under the actual circumstances it seems strange that should have arisen.

Did a pessimistic view of life cause it? Was it that I had contemplated men's various ambitions, the struggles they prompt, and the disappointments which usually follow, even when they succeed? I think not. Though one who was inclined to take gloomy views of things, and who contended that few ends we strive for are worth the labour expended in attaining them, might reasonably have included the writing of a successful book among these; yet I do not think that my experiences prompted any such view. I cannot assign any cause; but merely recognize this mood of mind as probably having had something to do with my comparative inactivity during the year.

Of anything to be called work, beyond that which my official duties entailed, I can recall little more than the revision of *Social Statics*. The book was going off well; and there was expectation that a second edition might be called for. Though I had spent a great deal of labour on

the manuscript and the proofs; yet while there remained a possibility of improving the expression, I was not content to let the book be reproduced without correcting it afresh. I obtained a set of unbound sheets, and in the course of the spring and summer went through them. Often putting one in my pocket and sallying out into the country, I broke my walk every now and then by lying down in some sheltered or shady place and castigating a few pages. Among my papers I believe there still exists the set of sheets thus revised. Inspection makes it manifest that the great aim was condensation—abridgment being here and there made by the omission even of a syllable.

Of serious occupation, if it may so be called, I am reminded of one further example by a letter to Lott, from which the following is an extract :—

"I have taken to the study of bones. Which being interpreted means that I am attending a course of Professor Owen's lectures on Comparative Osteology. I am much interested. I mean to make physiology [morphology, I should have said] my special study; bearing so much, as it does, on several subjects with which I propose to deal."

It seems not unlikely that the motive for wishing to hear these lectures arose from the fact that their title was suggestive of information bearing on the development hypothesis, in which I was already deeply interested.

One small addition to work done during the spring, was entailed by a question which came to me from the Congregational Board of Education. The question was whether I would permit the republication of the chapter on State-education in *Social Statics:* Mr. Samuel Morley (well known in later years as member of parliament for Bristol) being prepared to defray the expense. I willingly assented; and took the occasion to add a postscript of a few pages enforcing the argument. The republished chapter bore the paradoxical title—"State-Education self-defeating." The interpretation of the paradox was that any intellectual improvement gained is more than counter-balanced by the moral deterioration caused by absolving parents from a part of their responsibilities.

I see too, by references, that there was some reading at the British Museum. Had not the proof come before me, I should have denied that I ever in those days read there; and I was at first at a loss to know what was my motive. A letter to my father of February 15, 1851, enlightened me by the following sentences:—"I enclose you some memoranda I have been putting down at random in connexion with my theory of population. They accord with the conclusion I had previously arrived at on other grounds." Subsequent references show that this was the subject to which I was then chiefly devoting my attention.

The first two paragraphs of this chapter, descriptive of my state of mind early in 1851, were written at a time when my letters of that period were not accessible. On consulting them I find that in large measure they bear out the supposition which my remembrances suggested. Indeed a quite specific statement of my views about life, is contained in the following passage from a letter to my friend, written on April 15.

"Talking of marrying reminds me that here I am a bachelor still. I shall be 31 in the course of a few days and so far as appearances go, I am as far from being "settled in life," as the phrase is, as I was 10 years ago. Can't you give me a little advice? You as a man of experience in such matters ought surely to have something to communicate. However I do not know that I should take your advice if you gave it. As for marrying under existing circumstances, that is out of the question; and as for twisting circumstances into better shape, I think it is too much trouble. As I think you have heard me say—I don't mean to get on. I don't think getting on is worth the bother. On the whole I am quite decided not to be a drudge; and as I see no probability of being able to marry without being a drudge, why I have pretty well given up the idea.

"After all it does not much matter. If as somebody said (Socrates, was it not?)—marrying is a thing which whether you do it or do it not you will repent, it is pretty clear that you may as well decide by a toss up. It's a choice of evils, and the two sides are pretty nearly balanced. Come now, confess—is it not true that in respect of happiness the difference between married and unmarried life is not so great? As far as my observation goes, I cannot say that the Benedicks look a bit better in the face than the bachelors."

In a succeeding paragraph, however, it is remarked

that this view might very possibly be changed if due cause arose.

That I by no means undervalued the married state, but, contrariwise, looked forward to it as one to be achieved, was, indeed, shown in a very odd way: the evidence being of an extremely exceptional kind, if not, indeed, unique.

For sometime before, and for sometime after, the date at which I undertook my sub-editorial duties, there had been entertained by myself and sundry friends—Jackson, Loch, Lott, and another residing in Derby—the project of emigrating to New Zealand. Prospects here were not very brilliant for any of us; and we discussed the matter seriously. Books were read; and the reasons for and against duly weighed from time to time. Averse to unmethodic ways of judging, it occurred to me that aid might be had by making a rough numerical valuation of the several ends in life which might be respectively better achieved, these by staying at home and those by emigrating; and that by adding up the numbers on each side, totals would be obtained which would yield more trustworthy ideas of the relative advantages than mere unaided contemplation. Among my papers I find I have preserved the estimates then made. Here they are.

England		*New Zealand*	
Advantages		*Advantages*	
10	Greater domestic comforts	20	More agreeable climate
10	Larger choice of society	40	Better health
20	Excitement in Literature	30	Less anxiety
6	——— Science	35	More natural and therefore happier occupation
10	——— Art	30	Eventually more spare time
30	Intercourse with relations	25	Ample provision for old age and better prospect for family
5	Theatres	100	Marriage
8	Music	8	Literature
8	Politics	3	Science
3	Accessibility of Continent	6	Music
		4	Politics
110		301	

The implication is decided enough. The relative values

assigned make it clear that a state of celibacy was far from being my ideal.

I may add that the scheme was gradually and silently abandoned by all except Jackson, who, unfortunately, carried it out. A passage in the above-quoted letter to Lott says that "Jackson has finally decided to go to New Zealand in the autumn". Thinking that farming held out better prospects than engineering, he took steps to fit himself for it, and went into the country to get some lessons.

"He left for Wokingham in Berks about a week since, and is now, I suppose, deeply absorbed in *The Muck-Manual*, probably relieving his severer studies by getting a few wrinkles in the farm-yard respecting the weaning of calves and the killing of pigs, interspersed by stray hints from the dairy-maid. New Plymouth is the settlement he thinks of going to. He is to marry before he goes. In fact it is his wish to bring his long-standing engagement to a close that has determined him to emigrate."

I have said above that the fulfilment of the scheme by him was unfortunate. Not long after his arrival in New Zealand, and while still undecided respecting his career, he went with others on a boating excursion out to sea. The boat capsized, and he was drowned. His death made the first gap in my group of friends—took from me one associated in my memory with many happy days; and, as may be supposed, was the more felt. It was felt, too, by all who knew his worth. Though the world did not lose in him a bright intellect, yet it lost a fine nature.

I do not remember for what reason I myself gave up the thought of emigration. I had originally proposed that my father and mother should go also; but they were too far advanced in life. Probably a chief deterrent from the scheme, was the consciousness that for an only child to go to the Antipodes and leave parents alone in their declining years, would be cruel.

After a changeful history, *The Westminster Review* had, about this time, by the losses it entailed on its immediate supporters, tired them out. During its earlier days

it had been kept afloat by subsidies from Sir William Molesworth and Mr. J. S. Mill; the last of whom, himself a large contributor to its pages as well as to its funds, for a long time played the part if not of nominal editor yet of actual editor. The last editor under the superintendence of Mr. Mill was Mr. Robertson. At a later period the Review was bought by Mr. Hickson; and an endeavour was made by lower rates of payment to contributors, as well as, probably, by gratis articles, to make it meet its expenses. Though still owned by Mr. Hickson, it was at the beginning of 1851, edited by Mr. Slack.

In the spring of that year negotiations were opened for sale of it to Mr. Chapman; and by the middle of May, the negotiations were so far advanced that Mr. Chapman was making his arrangements, and casting about for contributors. In a letter to my father dated May 21, a passage concerning this matter runs as follows:—

"Chapman (I tell you this in confidence) is about to have the *Westminster Review*. It will come into his hands at the end of the year. Chapman has twice proposed to me to write an article for the January number. The first time he proposed the population question on which he knows my views. But I declined on the ground that I wished to make it the subject of a book. His second proposal, made to day, I have thrown cold water on by telling him that agreeing to get an article ready for the 1st Jany would interfere with the population book, which I intend to begin as soon as I have revised *Social Statics*. Mr. Greg in a letter which Chapman showed me about the management of the Westminster in its new hands, quite counts upon me as a constant contributor; but I do not feel inclined to sacrifice my existing projects."

I find the sentence in a subsequent letter—

"He (Chapman) has been wanting me to write him an article on the suffrage for the Jan. No, but I tell him I do not think I am fitted to produce the kind of article he wants, viz. a so-called practical one."

Respecting the population question referred to above, I may add that subsequent letters show that my preparations for a book on it had advanced further than memory led me to suppose. There is mention of a programme which I was drawing up; and the answer to one of my father's questions, written late in the autumn, is—"I shall finish the

skeleton before sending it [to you]: There will be some 20 odd chapters."

The year 1851 was the year of the Great Exhibition; and the first of May brought the opening by the Queen. In my journalistic capacity I had free admission, but made no use of it on that day: neither then nor at any time caring to be a spectator of State-ceremonies or royal pageants. Next day, however, I promptly availed myself of my entrance ticket; and thereafter many days and half days were passed with pleasure and profit in studying the arts and industries of the various European peoples. Exhibitions, more or less extensive, have now become common things; but at that date nothing of the kind had been seen. Of course the interest excited far exceeded any interest excited at present. As the season advanced, a good deal of time was spent in playing the guide to country relatives and friends.

Here I am reminded of the divergent opinions which were entertained concerning this industrial show and its consequences. At the one extreme were many over-sanguine people who expected it to inaugurate a universal peace. At the other extreme came Mr. Carlyle, uttering fierce denunciations with all that power of language characteristic of him. And with these aberrant judgments I may join one published in *Blackwood's Magazine;* where a writer describing the impressions supposed to be produced by the Exhibition on the Ghost of Voltaire, makes him express the belief that the only improvement worthy of note since his day was the lucifer match!

One other incidental fact may be added. When the Exhibition was about to be closed, it was suggested that the iron and glass building used for it should be retained as a winter-garden. Londoners at large would have derived great advantage had it been made permanent; for not only as a winter-garden would it have been available,

but also as a charming promenade in wet weather at all parts of the year. The owners and occupiers of houses in Prince's Gate and the immediate neighbourhood, however, gave a determined opposition to the proposal. Though it could not be said that the building was an eyesore, yet it was clear that were a winter-garden made of it, the traffic along the Kensington road would be, on Sundays and holidays, greatly increased. Notwithstanding the comparatively small number of those whose interests were thus adverse to the project, they prevailed. The building was pulled down; and millions of people were deprived of refining pleasure.

The fact furnishes another illustration of the truth, often illustrated, that a small body of men deeply interested and able easily to co-operate, is more than a match for a vast body of men less deeply interested and unfavourably circumstanced for co-operation.

When, in the last chapter, I remarked that I failed to take advantage of such opportunities as occurred of widening my social relations, I forgot an all-important exception. There resulted one intimacy which had marked effects on my life.

A generation earlier, a conspicuous part had been played in public life by Mr. William Smith, for many years member of parliament for Norwich. His were the times during which immense sums were lost over contested elections; and he is said to have spent three fortunes in this way: not for the gratification of personal ambition, but prompted by patriotic motives. For, himself a Unitarian, he was the leading representative of the much-oppressed dissenters; and it was he who, by untiring efforts, finally succeeded in obtaining the abolition of the Test and Corporation Acts. Various of his descendants have been conspicuous for their public spirit, philanthropic feeling, and cultivated tastes. From the eldest

son, his father's successor in Parliament, descended Mr. Benjamin Leigh Smith, whose achievements as an Arctic explorer are well known, and Madame Bodichon, of note as an amateur artist, and active in good works. One of the daughters became Mrs. Nightingale of Lea Hurst; and from her, besides Lady Verney, came Miss Florence Nightingale.

Among the younger sons was Mr. Octavius Smith, who might be instanced in proof of the truth—very general but not without exception—that originality is antagonistic to receptivity. For having in early life been somewhat recalcitrant under the ordinary educational drill, he was in later life distinguished not only by independence of thought, but by marked inventiveness—a trait which stood him in good stead in the competition which, as the proprietor of the largest distillery in England, he carried on with certain Scotch rivals. Energetic in a high degree, and having the courage and sanguineness which come from continued success, he was full of enterprizes: sundry of them for public benefit. Partly because of the personal experiences he had in various directions of the obstacles which Governmental interferences put in the way of improvement, and partly as a consequence of the fact that being a man of vigour and resource he was not prone to look for that aid from State-agencies which is naturally invoked by incapables, he was averse to the meddling policy, much in favour then, and still more in favour now. One leading purpose of *Social Statics* being that of setting forth both the inequity and the mischief of this policy, a lady who knew Mr. Octavius Smith's views, planned an introduction, and this having been made, there was initiated an acquaintanceship which afterwards grew into something more.

I have been very fortunate in my friendships; and not the least so in that with Mr. Octavius Smith. In later

years I owed to him the larger part of my chief pleasures in life.

Already I have named the fact that in the Spring of 1850, I met Mr. G. H. Lewes; and that in the course of our walk home from a *soirée*, a conversation between us produced mutual interest. When *Social Statics* came out he spoke highly of it, both privately and in public as literary editor of *The Leader*; and naturally when we met again, a further step was taken towards intimacy. As we had many tastes and opinions in common, the intimacy grew rapidly.

When the summer came there resulted country excursions together—the early ones being long Sunday rambles in Wimbledon Park, Richmond Park, etc.: a companion on the first occasion being Mr. E. S. Pigott, now Licenser of Plays, and at that time interested in *The Leader* as one who subscribed part of the capital. Later in the season our excursions took a wider range. The longest of them was up the valley of the Thames:—by railway to Slough and thence on foot to Cookham, where we slept; next day we went along the Thames-bank by Marlow and on to Henley, where our day's walk ended; leaving there on the Monday, we reached by the help of a coach drive, Pangbourne, and eventually Goring, where we stopped for the night; and next day we walked as far as Abingdon, whence we returned by railway. The expedition was a memorable one for both of us; not only because of its enjoyments, which were great, but also because of its mental results. It was to the impulse he received from the conversations during these four days, that Lewes more particularly ascribed that awakened interest in scientific inquiries which is referred to in an extract from his diary published in George Eliot's *Life*. And in me, observation on the forms of leaves set going a train of thought which ended in my writing an essay on "The Laws of Organic Form"; an extended exposition of which occupies some

space in *The Principles of Biology*. Later in the autumn, Kent was the scene of another ramble: Gravesend, Maidstone and Cobham being among the places on our route. Lewes remarked at its close, that the ramble had not been so rich in suggestions as the preceding one; but he had brought with him a volume by Milne-Edwards, and in it for the first time I met with the expression—"the physiological division of labour." Though the conception was not new to me, as is shown towards the end of *Social Statics*, yet the mode of formulating it was; and the phrase thereafter played a part in my course of thought.

As a companion Lewes was extremely attractive. Interested in, and well informed upon, a variety of subjects; full of various anecdote; and an admirable mimic; it was impossible to be dull in his company. Now-a-days he is chiefly known by the contributions to philosophy in his *Problems of Life and Mind;* but his reputation was then mainly that of an extremely versatile man—a critic and writer on general literature, a novelist, a dramatist, an actor, an expositor of philosophy. This last combination recalls a droll incident in his career. He delivered a series of lectures on philosophy in the provinces; and, among other places, in Edinburgh. There, after his last lecture had been given, the play-bills announced *The Merchant of Venice*, with Mr. Lewes in the part of Shylock. The dramatic element in the performance was, I doubt not, good; and I dare say his dramatic faculty justified the thought which he at one time entertained of going upon the stage. But his figure was not sufficiently impressive for many parts; and his voice was not effective.

I knew nothing in those days of his domestic life, or, indeed, of anything concerning him beyond that which our conversations disclosed. But alike then and afterwards, I was impressed by his forgiving temper and his generosity. Whatever else may be thought, it is undeniable that he discharged the responsibilities which devolved upon him

with great conscientiousness, and at much cost in self-sacrifice, notwithstanding circumstances which many men would have made a plea for repudiating them.

One result of my friendship with Lewes was that I read some of his books. His first novel, *Ranthorpe*, he spoke of disparagingly; but of his second, *Rose, Blanche, and Violet*, he entertained a better opinion. This I read. So far as I remember it did not make upon me any decided impression one way or the other. A more important result, however, was that I read his *Biographical History of Philosophy*, then existing in its original four-volumed form, in the series of shilling volumes published by Knight, who was one of the pioneers of cheap literature.

Up to that time questions in philosophy had not attracted my attention. On my father's shelves during the years of my youth and early manhood, there had been a copy of Locke's *Essay* which I had never looked into; and as I had not utilized a book constantly at hand, it may naturally be inferred that I had not troubled myself to obtain other books dealing with the same and kindred topics. It is true that, as named in my narrative of that period, I had in 1844 got hold of a copy of Kant's *Critique*, then, I believe, recently translated, and had read its first pages: rejecting the doctrine in which, I went no further. It is also true that though, so far as I can remember, I had read no books on either philosophy or psychology, I had gathered in conversations or by references, some conceptions of the general questions at issue. And it is no less true that I had myself, to some extent, speculated upon psychological problems,—chiefly in connexion with phrenology. The fact, already named, that I had in 1844 arrived at the conclusion long before set forth by Adam Smith, that from the sympathetic excitement of pleasurable and painful feelings in ourselves, there originate the actions commonly grouped as benevolent, shows that I was somewhat given to

the study of our states of consciousness; and *Social Statics*, in which the sentiment of justice is interpreted after the same general manner as that of benevolence, and in which a good deal is said concerning the development of the moral nature, shows that the tendency to mental analysis had become pronounced. Still, I had not, up to 1851, made the phenomena of mind a subject of deliberate study.

I doubt not that the reading of Lewes's book, while it made me acquainted with the general course of philosophical thought, and with the doctrines which throughout the ages have been the subjects of dispute, gave me an increased interest in psychology, and an interest, not before manifest, in philosophy at large; at the same time that it served, probably, to give more coherence to my own thoughts, previously but loose. No more definite effect, however, at that time resulted, because there had not occurred to me any thought serving as a principle of organization. Generally, if not always, it happened that a subject became interesting to me only when there had arisen some original conception in connexion with it. So long as it came before me as a collection of other men's conclusions which I was simply to accept, there was usually comparative indifference. But when once I had got some new idea, or idea which I supposed to be new, relating to the subject, an appetite for its facts arose in me as furnishing materials for a coherent theory. The ideas which were to play this part in psychology, and eventually in philosophy, had not yet arisen.

One sequence of my intimacy with Lewes was that I made the acquaintance of Carlyle; to whose house Lewes took me towards the close of October. Here, in an extract from one of my letters to Lott, is conveyed my impression of him.

"I spent an evening at Carlyle's some fortnight since. He is a queer creature; and I should soon be terribly bored with him were I long in

his company. His talk is little else than a continued tirade against the "horrible, abominable state of things." (The undulating line is meant to indicate his up and down Scotch emphasis.) He was very bitter against the Exhibition, amongst other things, and was very wroth at the exposure to the public of such disgusting brutes as the monkeys at the Zoological Gardens. He talks much as he writes, piling epithet upon epithet, and always the strongest he can find. You would hardly recognize him by the likeness you have. He has much colour in his cheeks while your portrait suggests pallor. He is evidently fond of a laugh; and laughs heartily. But his perpetual grumbling at everything and everybody is so provoking, and it is so useless to reason with him, that I do not want to see much of him. I shall probably call to look at him two or three times a year. His wife is intelligent but quite warped by him. And for your wife's information I may state that there are no 'little Carlyles.'"

The anticipation that my intercourse with him would be but small, was verified. My visits numbered three, or at the outside four, always in company with Lewes; and then I ceased to go. I found that I must either listen to his absurd dogmas in silence, which it was not in my nature to do, or get into fierce argument with him, which ended in our glaring at one another. As the one alternative was impracticable and the other disagreeable, it resulted that I dropped the acquaintanceship. My course was, I suppose, in this as in many other things, somewhat exceptional; for his talk was so attractive from its originality and vigour of expression, that many sought the gratification given by these, and for the sake of the manner disregarded the matter.

Lewes used to say of him that he was a poet without music; and to some, his denunciations have suggested the comparison of him to an old Hebrew prophet. For both of these characterizations much may be said. By others he has, strange to say, been classed as a philosopher! Considering that he either could not or would not think coherently—never set out from premises and reasoned his way to conclusions, but habitually dealt in intuitions and dogmatic assertions, he lacked the trait which, perhaps more than any other, distinguishes the philosopher properly

so called. He lacked also a further trait. Instead of thinking calmly, as the philosopher above all others does, he thought in a passion. It would take much seeking to find one whose intellect was perturbed by emotion in the same degree. No less when tested by various of his distinctive *dicta* and characteristic opinions, does the claim made for him to the name of philosopher seem utterly inadmissible. One whose implied belief was that the rule of the strong hand, having during early ages and under certain social conditions, proved beneficial, is therefore good for all time, proved by it how little he had got beyond that dogma which children take in along with their creed, that human nature is everywhere the same and will remain the same for ever. One who sneered at political economy as the "dismal science," implying either that the desires of men working together under social conditions do not originate any general laws of industrial action and commercial movement; or else that it is of no consequence whether we recognize such laws or not; or else that because the study of such laws is uninteresting they may as well be ignored; betrayed neither the temper nor the insight which befit the philosopher. One who grew blindly furious* over John Mill's work *On Liberty*—one who scornfully called utilitarianism "pig-philosophy," and thereby identified the pursuit of utility with the egoistic pursuit of material gratifications, spite of the proofs before him that it comprehends the pursuit of others' welfare and the exercise of the highest sentiments, displayed an inability to think discreditable to an ordinary cultivated intelligence, much more to one ranked as a thinker. No one to whom the name philosopher is applicable, could have acquired that insensate dislike of science which he betrayed; and which, for example, prompted him in pursuance of his school-boy habit of nicknaming, to speak continually of "Earth-flattener Maupertuis"; as though to have discovered

* "Carlyle and Mrs. Carlyle: a ten years' reminiscence," by H. Larkin. *British Quarterly Review*, July 1881, p. 73.

the oblateness of the Earth's figure was something discreditable. At the same time that he was continually insisting upon the laws of this Universe and the necessity for respecting them, he went on venting his scorn against those who devote their lives to learning what these laws are. Some of his dogmas, indeed, are such as would, if uttered by a person of no authority, be inevitably considered incredibly stupid; as instance his assertion that genius "means transcendent capacity of taking trouble first of all:" the truth being that genius may be rightly defined quite oppositely, as an ability to do with little trouble that which cannot be done by the ordinary man with any amount of trouble.

Morally he was characterized by a large amount of what he himself somewhere calls "the old Norse ferocity": one of the results being a combativeness so great that, as I can myself testify, he would oppose his own doctrines if they came back to him through the mouth of another. Lewes told me that one afternoon, having called and found him walking up and down the garden with Arthur Helps, he heard, as he approached them from behind, praises of George Sand uttered by Carlyle; and thereupon, as he joined them, exclaimed—"I am glad to hear you say that, Carlyle;" upon which Carlyle immediately began to revile her as much as he had before praised her. Of course he was perpetually led into such inconsistencies and perversities by his love of forcible speech. The passion for making points was so great that he could not bear to put the needful qualification to any strong utterance, because the effect would be partially lost; and hence, notwithstanding all his talk about "the veracities," his writing was extremely unveracious. Exaggeration is unveracity; and one who perpetually uses the strongest epithets, which in the nature of things are but occasionally applicable, necessarily distorts his representations of things.

Naturally, with his constitutional tendency to antagonism, his delight in strong words, and his unmeasured assumption

of superiority, he was ever finding occasion to scorn and condemn and denounce. By use, a morbid desire had been fostered in him to find badness everywhere, unqualified by any goodness. He had a daily secretion of curses which he had to vent on somebody or something.

Of course I do not mean to say that these traits of character were not joined with admirable traits. Various of those who knew him intimately, unite in representing him as having had a great amount of generosity and even a great depth of tenderness, in his nature; and his treatment of his relatives makes his constant self-sacrifice for others' benefit undeniable. He illustrates a truth which we do not sufficiently recognize, that in human beings, as in lower creatures, tendencies of apparently the most opposite kinds may co-exist. A dog, the moment after displaying the greatest affection for his master, will with no adequate cause fly at a stranger, or furiously attack another dog inoffensively trotting by; and in a child the whole gamut of emotions is not unfrequently run through in a few minutes. Similarly with the more impulsive men, the manifestations of the destructive and sympathetic feelings are sometimes strangely intermingled. Carlyle's nature was one which lacked co-ordination, alike intellectually and morally. Under both aspects he was, in a great measure, chaotic. His ideas of the world and mankind were never reduced to anything like rational order; and his strong emotions, fretted into intensity by his own violent language, rose into gusts of passion carrying him now this way and now that: little if any effort at self-control being made, but rather the rein being deliberately given to whatever feeling was for the time uppermost.

Doubtless his extreme irascibility and his utterance of bitter and contemptuous speeches about almost everybody, were in part due to his chronic dyspepsia. But it is made clear by his own account of himself in early life, and by his mother's characterization of him, that he was innately

despotic and arrogant in extreme degrees. For this reason his opinions on men and things would have to be largely discounted, even were there not the reason that one so markedly characterized by un-coordinated thoughts and feelings, was unfitted for guiding his fellow men.

The title of this chapter was chosen at a time when I had nothing at hand to aid my memory; and though reading the correspondence shows that I was doing more than I supposed, the title is, on the whole, appropriate. With but moderate diligence I might, in the course of the year, have written the small book on the population question which I contemplated, instead of merely collecting materials and arranging the argument. To the trivial pieces of work named at the outset, has to be added only a piece, no less trivial, done at the close of the year; which I name not as in itself worth naming, but because it introduces an incident of moment.

In preparation for the first number of *The Westminster* issued under his auspices, Chapman asked me to write, for his quarterly review of contemporary literature, a notice of a recently-issued edition of Carpenter's *Principles of Physiology, General and Comparative.* This I agreed to do. In the course of such perusal as was needed to give an account of its contents, I came across von Baer's formula expressing the course of development through which every plant and animal passes—the change from homogeneity to heterogeneity. Though at the close of *Social Statics* there is a recognition of the truth that low types of society in common with low types of organisms, are composed of many like parts performing like functions, whereas high types of society in common with high types of organisms, are composed of many unlike parts performing unlike functions, implying that advance from the one to the other is from uniformity of composition to multiformity of composition; yet this phrase of von Baer expressing the

law of individual development, awakened my attention to the fact that the law which holds of the ascending stages of each individual organism is also the law which holds of the ascending grades of organisms of all kinds. And it had the further advantage that it presented in brief form, a more graphic image of the transformation, and thus facilitated further thought. Important consequences eventually ensued.

Returning to the year's activities or rather inactivities, I perhaps ought to say that though I did but little visible work, there appears to have been done a good deal of invisible work. A letter to my father dated September 1, recalls a scheme, suggested I fancy by my excursions with Lewes, which is described as follows :—

"I have lately been jotting down ideas on all kinds of topics which have been accumulating with me for years past, and which, as being too unimportant for separate essays, I mean some day to embody in a series of magazine articles under the head of "Travel and Talk." The idea being to develop them in a natural kind of way in the course of conversation between some friends on a walking tour."

And in a letter of September 3, I find the following further passage referring to the project :—

"My proposed series of papers to be called T. and T. I have projected mainly with the view of pecuniary profit, if I should find that the demand for my literary aid should become such as to enable me to relinquish my present position, as I think it will by and by do. The prevalent notion that literary men are not able to make a decent living, I find to be an erroneous one. I find that 5 and 6 hundred a year are common incomes obtained by the pens of men of no great original talent. And if so, I do not think it unreasonable to expect that I might certainly make as much as I have now, with no greater expenditure of time than I now give to the *Econ.* and with the satisfaction of getting quit of part of the overwhelming accumulation of thoughts which now bother me."

Again on September 22, along with an account of the excursion made with Lewes up the valley of the Thames, and evidently referring to something said during the excursion, occurs the sentence—"They want me to write some papers for the 'Portfolio' of the *Leader* at a guinea a column. What do you say?" [*The Leader* was like in

size to *The Spectator.*] Elsewhere, replying to a question, I tell my father that I have declined to add my name to papers written for *The Leader,* because I decline to be identified with the socialistic views promulgated in it. Concerning these contributions, which it was therefore arranged should be anonymous, a subsequent letter says :—

"Lewes and I have decided against the dialogue form for these papers for the *Leader.* As they will be very miscellaneous there has been some hesitation about the title; and it has been decided to choose one which means nothing, but will draw attention. It is to be—"The Haythorne Papers."

The course of my life during 1851 closed pleasantly. By arrangement with Mr. Hodgskin to do some of his work if he would do some of mine, I got a greater length of absence than four days; and utilized it by passing a week at home and going thence to spend Christmas with the Potters at Hampstead near Gloucester, to which place they had removed from Gayton Hall.

CHAPTER XXVII.

A MORE ACTIVE YEAR.

1852. Æt. 31—32.

Of things done this year the first worthy of naming was an essay, insignificant in length but significant in matter, on "The Development Hypothesis," published in *The Leader* in March. For a long time entertained, and becoming gradually more confirmed, my belief in this was now avowed.

To the allegation that no cases are proved of a new species arising by progressive modifications, was opposed the fact that the rise of a species by special creation is absolutely unknown: the special-creation hypothesis simply formulates ignorance into a semblance of knowledge. Moreover, while the assumed process of special creation is not only unknown but cannot in the last resort be rationally conceived, the process of development by successive modifications is one the nature of which is everywhere exemplified in the visible changes produced in organisms by changed conditions. It was pointed out that other groups of phenomena, as those which geometry presents, show us how, by a succession of infinitesimally small changes, there is effected a transmutation of forms so great that the extreme terms seem to have no conceivable relation to one another; and it was inferred that, similarly, it is perfectly credible that organisms the most apparently unlike, may be connected by insensible gradations. Finally it was argued that during the growth of a seed into a plant, or an ovum into an adult animal,

there takes place a metamorphosis no less complicated and no less marvellous than the metamorphoses which the development hypothesis supposes to have taken place in successive generations of organisms during millions of years; and that therefore there is nothing unreasonable in the belief that there have occurred in the second case, tranformations similar in their successions and degrees to those which we see occur in the first.

In this essay there took a definite shape the germ out of which originated the general system of thought elaborated in subsequent years.

In the last chapter it was said that I declined to write for the first number of *The Westminster Review*, an article setting forth the conclusions at which I had arrived concerning the law of population, because I wished to reserve the subject for larger treatment in a book. Late in the year, however, this decision was changed. A letter to my father on December 9, contains the passage:—

"I have agreed to give Chapman an outline of my theory of Population for the *Westminster*. I must set to at it shortly to get it ready for the April number. I have thought it safer to do this, as I can then proceed with the development of it at leisure, and need be under no fear of being forestalled."

The general idea elaborated in this essay, which was published under the title—"A Theory of Population deduced from the General Law of Animal Fertility," had been entertained by me since 1847 at the latest, when I remember propounding it to a friend: how long before, I cannot tell. I had, as already indicated, been collecting materials for it early in 1851; and writing it occupied me during January, February, and part of March, 1852. Its argument well exemplified several intellectual characteristics. There was the tacit belief that the degrees of fertility of organisms, from the lowest to the highest, are naturally

determined and not supernaturally designed; that is, are physically caused. There was the implication that a certain law of multiplication holds throughout:—the law being that the degree of fertility is inversely proportionate to the grade of development; as measured here by bulk, there by structure, there by activity, and commonly by all of these. There was the conclusion, drawn without hesitation, that in virtue of this law, holding no less of man than of organic beings at large, higher degrees of evolution must be accompanied by lower rates of multiplication. And a further characteristic trait was the tacit faith in a tendency towards self-adjustment—the movement of things towards equilibrium: in this case towards a balance between rate of mortality and rate of reproduction. Obviously these are all aspects of that developmental view which had grown so dominant with me.

From the following passages it will be seen that towards the close of the article, I came near to a doctrine which eight years later initiated a transformation in the conceptions of naturalists:—

"From the beginning, pressure of population has been the proximate cause of progress." (p. 501).

"And here it must be remarked, that the effect of pressure of population, in increasing the ability to maintain life, and decreasing the ability to multiply, is not a uniform effect, but an average one. . . . All mankind in turn subject themselves more or less to the discipline described; they either may or may not advance under it; but, in the nature of things, only those who *do* advance under it eventually survive. . . . For as those prematurely carried off must, in the average of cases, be those in whom the power of self-preservation is the least, it unavoidably follows that those left behind to continue the race, are those in whom the power of self-preservation is the greatest—are the select of their generation." (pp. 499-500).

It seems strange that, having long entertained a belief in the development of species through the operation of natural causes, I should have failed to see that the truth indicated in the above-quoted passages, must hold, not of mankind only, but of all animals; and must every-

where be working changes among them. If when human beings are subjected by pressure of population to a competition for the means of subsistence, it results that on the average the tendency is for the select of their generation to survive, so, little by little, producing a better-adapted type; then the like must happen with every other kind of living thing similarly subjected to the "struggle for existence." And if so, this must be in all cases a cause of modification. Yet I completely overlooked this obvious corollary—was blind to the fact that here was a universally-operative factor in the development of species. There were, I think, two causes for this oversight.

One was my espousal of the belief that the inheritance of functionally-produced modifications suffices to explain the facts. Recognizing this as a sufficient cause for many orders of changes in organisms, I concluded that it was a sufficient cause for all orders of changes. There are, it is true, various phenomena which did not seem reconcilable with this conclusion; but I lived in the faith that some way of accounting for them would eventually be found. Had I looked more carefully into the evidence, and observed how multitudinous these inexplicable facts are—had I not slurred over the difficulties, but deliberately contemplated them; I might perhaps have seen that here was the additional factor wanted.

A further cause was that I knew little or nothing about the phenomena of variation. Though aware that deviations of structure, in most cases scarcely appreciable but occasionally constituting monstrosities, occur among all organisms; yet I had never been led to think about them. Hence there lacked an indispensable idea. Even had I become distinctly conscious that the principle of the survival of the select must hold of all species, and tend continually to modify them; yet, not recognizing the universal tendency to vary in structure, I should have failed to recognize a chief reason why divergence and re-divergence must everywhere go on—

why there must arise multitudinous differences of species otherwise inexplicable.

When recalling the doings of past years, I have sometimes been at a loss to decide how it was, and when it was, that I first entertained the thought of writing upon Psychology. Had I been forced to say, I should have said that the beginning of 1854 was the time, and that the composition of an essay on "The Genesis of Science" was the cause. I should have been quite wrong, however. To my surprise, correspondence proves that the design dates back to the beginning of 1852; and that I had then reached some, at any rate, of the leading ideas eventually set forth. A letter written to my father on the 12th of March, 1852, contains the paragraph:—

"I shall shortly begin to read up in preparation for my 'Introduction to Psychology.' Probably it will be the close of next year before I have it ready for the press. I intend it to be preliminary to a large work on Psychology, probably extending to more than one volume. This introduction will contain the general principles, and will foreshadow the character of the book itself."

The first sentence implies that the intention had arisen some time before this date; for I speak of the work to my father as though he had already been told of it. Probably it was during my stay at Derby, at the close of the preceding December, that I named the intention to him. It is further manifest that there must already have been reached the general conceptions eventually set forth; since, otherwise, there would have been no thought of "a large work on psychology probably extending to more than one volume." A fortnight later, namely on the 25th, I wrote home—

"I am just beginning to read Mill's Logic. This is my first step towards preparing for my 'Introduction to Psychology' which I mean to begin vigorously by and by."

No further reference to the subject appears in the

correspondence until a letter of October 1, in which I find the paragraph—

"I am busy with the Psychology, and have drawn up an outline of the section on the 'Universal Postulate.'"

Thus it appears that the general interest in mental phenomena indicated in the last chapter as having been shown in sundry ways, and which I there inferred was increased by reading Lewes's *Biographical History of Philosophy* in the autumn of 1851, quickly, under that stimulus, began to have results. It was there remarked, that some original conception in relation to the subject was needed to give me the requisite spur; and this requirement was, it seems, fulfilled much sooner than I supposed.

A matter of very different nature comes next to be named—something thoroughly practical following something quite theoretical. The long-standing arrangements for the distribution of books, not inappropriate to a time when the demand for them was small and the means of communication undeveloped, had quite lost their fitness in railway days and days of cheap literature. Dissatisfaction had, I presume, been growing; and about this time began to take shape. Under the title—"The Commerce of Literature," Mr. Chapman published an article upon the subject in *The Westminster Review*, in which he described the trade-organization, and the coercive regulations by which it maintained the retailers' rates of profit. The following sentences set forth the essential points:—

"A volume, the published price of which is 12*s*, is sold to the trade in single copies at 9*s*. . . . But should the purchaser take 25 copies at once, he is only charged for 24, at 8*s* 6*d* each, thus making a total discount allowed to the trade of 33 per cent., which is therefore the amount paid by the publisher for distribution, exclusive of the additional 10 per cent. retained by himself as his remuneration, when he is employed by an author. . . . It appears, then, that when the nominal price of a book is 12*s*, the publisher really gets for it about 8*s*, leaving 4*s* to remunerate the agents who place the book in the hands of the public."

There resulted a movement among authors, in which I

took an active part—indeed, as correspondence shows, a more active part than I remembered. The following is an extract from a letter to my father written in May:—

"I have been very busy these two weeks past on this bookselling question. Never let it be said that one man can do but little. The meeting held at Chapman's on Tuesday, and of which I enclose a report, originated with my urging it upon him, and going with him to call on the leading men. I have marked some passages in his statement which I wrote for him; as also two resolutions. I declined taking any part in the proceedings. The meeting will probably be fatal to the Bookselling Association."

It was fatal—to the system at least. Whether the Booksellers' Association continued to exist, I do not know. Dickens occupied the chair; and sundry men of note took part in the proceedings. One of them was Prof. Owen, who, I remember, made the statement that when he wanted to publish a new book, the question with him always was whether he could afford the entailed loss. One incident of the occasion, perhaps worth naming, is that before the meeting, a number of copies of resolutions being required, Miss Evans and I undertook the task of making them. I remember being struck with her great rapidity in writing—far exceeding my own. She wrote at that time a very much larger and more masculine hand than that given as a sample in Mr. Cross's life of her: a hand of something like double the size and more sweeping in character.

What were the immediate effects of the meeting I cannot recollect; but the ultimate effect was that the question between the authors and the booksellers was referred to Lord Campbell as arbitrator. He gave a decision against the booksellers; and there were consequently abolished such of the trade-regulations as interdicted the sales of books at lower rates of retail profit than those authorized.

The free system worked in a way not altogether satisfactory. One would have thought that when it was agreed by the trade, no longer to insist on the high percentages above named, custom would have established lower percentages. This, however, was not done in a direct way.

The old scale was continued; and the only change made was that the retailer who sold at a lower rate of profit, was no longer regarded as a black sheep, and no longer obliged to get his supplies of books, when he got them at all, in underhand ways. There consequently arose the now-established system of making large discounts from the nominal prices. I speak of this arrangement as unsatisfactory, because many persons are misled by the nominal prices. If one who is not much in the habit of buying books, sees a book advertised at twelve shillings, he is apt to be deterred by what he thinks too high a price for his purse: either not knowing, or not remembering at the moment, that he can obtain it for nine shillings—a price he would not have hesitated to give had it been the price named.

At the close of the last chapter, and again in the foregoing section, there has occurred the name of Miss Evans—then little known but now of world-wide fame.

My acquaintance with her dated back to midsummer 1851. She was then visiting Chapman; and, while partly occupied in seeing the Great Exhibition, was, I suppose, partly occupied in discussing the arrangements for the conduct of *The Westminster Review*, in which it was proposed she should take part. In the autumn, when preparations for the first number of the new series of the Review were beginning, she came up to reside permanently in Chapman's house; and I then, and afterwards, saw her from time to time at his weekly *soirées*. As is implied by the reference to her at the close of Chapter XXV, our relations had become friendly before the end of 1850; and by the time at which the above-named meeting took place, there had arisen the intimacy described in her correspondence with her Coventry friends. A letter to Lott of the 23rd April speaks of—

"Miss Evans whom you have heard me mention as the translatress of Strauss and as the most admirable woman, mentally, I ever met. We have

been for some time past on very intimate terms. I am very frequently at Chapman's and the greatness of her intellect conjoined with her womanly qualities and manner, generally keep me by her side most of the evening."

For some time before the date of this letter, the occasions of meeting had been multiplied by the opportunities I had for taking her to places of amusement. My free admissions for two, to the theatres and to the Royal Italian Opera, were, during these early months of 1852, much more used than they would otherwise have been, because I had frequently—indeed nearly always—the pleasure of her companionship in addition to the pleasure afforded by the performance.

In presence of so much that is familiar concerning her powers and her character, as displayed in her works and delineated in biographies, it seems scarcely needful for me to say anything. Still, an account of her as she appeared during early days, when she was as yet unaffected by the incidents of her later life, may be of value as contributing to a complete estimate.

In physique there was, perhaps, a trace of that masculinity characterizing her intellect; for though of but the ordinary feminine height she was strongly built. The head, too, was larger than is usual in women. It had, moreover, a peculiarity distinguishing it from most heads, whether feminine or masculine; namely that its contour was very regular. Usually, heads have here and there either flat places or slight hollows; but her head was everywhere convex. Striking by its power when in repose, her face was remarkably transfigured by a smile. The smiles of many are signs of nothing more than amusement; but with her smile there was habitually mingled an expression of sympathy, either for the person smiled at or the person smiled with. Her voice was a contralto of rather low pitch and I believe naturally strong. On this last point I ought to have a more definite impression, for in those days we occasionally sang together; but the habit of subduing her

voice was so constant, that I suspect its real power was rarely if ever heard. Its tones were always gentle, and, like the smile, sympathetic.

These traits of manner resulted from large measures of both the factors which prompt altruistic feeling—the general sympathies and the domestic affections. The activity of these last largely conduced to the leading incidents of her subsequent life. That from her general sympathies resulted a great deal of the enthusiasm of humanity, scarcely needs saying. They also caused a desire to feel at one with society around. The throwing-off of her early beliefs left her mind in an attitude of antagonism which lasted for some years; but this was only a temporary feeling: her natural feeling was a longing to agree as far as possible. Her self-control, leading to evenness of temper was marked. Once only did I see irritation, not unjustified, a little too much manifested. Conscientious and just in all relations and consequently indignant against wrong, she was nevertheless so tolerant of human weaknesses as to be quickly forgiving; and, indeed, was prone to deprecate harsh judgments. This last trait was I doubt not in part caused by constant study of her own defects. She complained of being troubled by double consciousness—a current of self-criticism being an habitual accompaniment of anything she was saying or doing; and this naturally tended towards self-depreciation and self-distrust.*

* Most active minds have, I presume, more or less frequent experiences of double-consciousness—one consciousness seeming to take note of what the other is about, and to applaud or blame. Of late years various evidences have made me lean more and more to the belief in what has been called "the duality of the mind:" implying the ability of the two hemispheres of the brain to act more or less independently. Dreams have several times presented me with phenomena which, on any other hypothesis, seem inexplicable; and some few years ago a seemingly-conclusive experience occurred to me. Awaking one morning sufficiently to be conscious that I was awake, I nevertheless continued to dream, and for a few moments my waking consciousness watched my dreaming consciousness. Sundry analogies support the suspicion that the functions of the two hemispheres are specialized. A

Probably it was this last trait which prevented her from displaying her powers and her knowledge. The discovery of these had to be made gradually and incidentally. How great both were there is now no occasion to tell anyone. An extraordinarily good memory and great quickness of apprehension made acquisition of every kind easy; and along with this facility of acquisition there went an ability to organize that which she acquired, though not so great an ability. For her constructive imagination, remarkably displayed though it was in the creation of characters and the representation of mental states, did not serve her so well in other directions. She did not devise satisfactory plots; and her speculative faculty was critical and analytic rather than synthetic. Even as it was, however, her philosophical powers were remarkable. I have known but few men with whom I could discuss a question in philosophy with more satisfaction. Capacity for abstract thinking is rarely found along with capacity for concrete representation, even in men; and among women, such a union of the two as existed in her, has, I should think, never been paralleled.

In early days she was, I believe, sometimes vivacious; but she was not so when I first knew her, nor afterwards. Probably this was the reason why the wit and the humour which from time to time gave signs of their presence, were not frequently displayed. Calmness was an habitual trait. There was never any indication of mental excitement, still less of mental strain; but the impression constantly produced was that of latent power—the ideas which came from her being manifestly the products of a large intelligence working easily. And yet this large intelligence working easily, of which she must have been conscious, was not accompanied by any marked self-confidence.

limited specialization has been clearly proved to exist, and it seems to me likely that there is a wider specialization: one hemisphere perhaps taking the more complex co-ordinations of ideas and the other the simpler co-ordinations, and the two co-operating. May there not possibly be a bi-cerebral thinking, as there is a binocular vision?

Difference of opinion she frequently expressed in a half apologetic manner.

It was, I presume, her lack of self-confidence which led her, in those days, to resist my suggestion that she should write novels. I thought I saw in her many, if not all, of the needful qualifications in high degrees—quick observation, great power of analysis, unusual and rapid intuition into others' states of mind, deep and broad sympathies, wit and humour, and wide culture. But she would not listen to my advice. She did not believe she had the required powers.

In the course of the spring the name of Comte came up in conversation. She had a copy of the *Philosophie Positive*, and at her instigation I read the introductory chapters or "Exposition." As may be inferred from what has been said in past chapters, the task was not an easy one. Such knowledge of French as I had gained by scrambling through half-a-dozen easy novels, content to gather the drift, and skipping what I failed to understand, was of course very inadequate. What I thought about the doctrine of the three stages—theological, metaphysical, and positive—I do not clearly remember. I had never considered the matter and was not prepared either to deny or to admit. I believe I remained neutral. But concerning Comte's classification of the sciences I at once expressed a definite opinion. Here I had sufficient knowledge of the facts; and this prompted a pronounced dissent. She was greatly surprised: having, as she said, supposed the classification to be perfect. She was but little given to argument; and finding my attitude thus antagonistic, she forthwith dropped the subject of Comte's philosophy, and I read no further.

As the season advanced, our conversations were no longer always indoors or at places of amusement. Our most frequent out-door conversations occurred during walks along a quiet promenade near at hand. In those days, before the Thames Embankment was made, the southern

basement of Somerset House rose directly out of the water; and the only noises on that side came from the passing steam-boats. From end to end, this basement is surmounted by a balustrade, and behind the balustrade runs a long terrace: at that time as little invaded by visitors as by sounds. The terrace is shut off by a gate from one of the courts of Somerset House. Chapman had obtained a key of this gate; whether by favour or by some claim attaching to his house, the back of which abutted on Somerset House, I do not know. Frequently on fine afternoons in May, June and July, she obtained the key; and we made our way on to the terrace, where we paced backwards and forwards for an hour or so, discussing many things.

Of course, as we were frequently seen together, people drew their inferences. Very slight evidence usually suffices the world for positive conclusions; and here the evidence seemed strong. Naturally, therefore, quite definite statements became current. There were reports that I was in love with her, and that we were about to be married. But neither of these reports was true.

Here, *à propos* of a remark she made about me during the Spring, I may, more fitly perhaps than elsewhere, comment on a certain habit of thought which I described in consequence of her remark. *Social Statics* having, I presume, been referred to, she said that, considering how much thinking I must have done, she was surprised to see no lines on my forehead. "I suppose it is because I am never puzzled," I said. This called forth the exclamation —"O! that's the most arrogant thing I ever heard uttered." To which I rejoined—"Not at all, when you know what I mean." And I then proceeded to explain that my mode of thinking did not involve that concentrated effort which is commonly accompanied by wrinkling of the brows.

It has never been my way to set before myself a problem and puzzle out an answer. The conclusions at which I

have from time to time arrived, have not been arrived at as solutions of questions raised; but have been arrived at unawares—each as the ultimate outcome of a body of thoughts which slowly grew from a germ. Some direct observation, or some fact met with in reading, would dwell with me: apparently because I had a sense of its significance. It was not that there arose a distinct consciousness of its general meaning; but rather that there was a kind of instinctive interest in those facts which have general meanings. For example, the detailed structure of this or that species of mammal, though I might willingly read about it, would leave little impression; but when I met with the statement that, almost without exception, mammals, even as unlike as the whale and the giraffe, have seven cervical vertebræ, this would strike me and be remembered as suggestive. Apt as I thus was to lay hold of cardinal truths, it would happen occasionally that one, most likely brought to mind by an illustration, and gaining from the illustration fresh distinctness, would be contemplated by me for a while, and its bearings observed. A week afterwards, possibly, the matter would be remembered; and with further thought about it, might occur a recognition of some wider application than I had before perceived: new instances being aggregated with those already noted. Again after an interval, perhaps of a month perhaps of half a year, something would remind me of that which I had before remarked; and mentally running over the facts might be followed by some further extension of the idea. When accumulation of instances had given body to a generalization, reflexion would reduce the vague conception at first framed to a more definite conception; and perhaps difficulties or anomalies passed over for a while, but eventually forcing themselves on attention, might cause a needful qualification and a truer shaping of the thought. Eventually the growing generalization, thus far inductive, might take a deductive form: being all at once recognized

as a necessary consequence of some physical principle—some established law. And thus, little by little, in unobtrusive ways, without conscious intention or appreciable effort, there would grow up a coherent and organized theory. Habitually the process was one of slow unforced development, often extending over years; and it was, I believe, because the thinking done went on in this gradual, almost spontaneous, way, without strain, that there was an absence of those lines of thought which Miss Evans remarked—an absence almost as complete thirty years later, notwithstanding the amount of thinking done in the interval.

I name her remark, and give this explanation, partly to introduce the opinion that a solution reached in the way described, is more likely to be true than one reached in pursuance of a determined effort to find a solution. The determined effort causes perversion of thought. When endeavouring to recollect some name or thing which has been forgotten, it frequently happens that the name or thing sought will not arise in consciousness; but when attention is relaxed, the missing name or thing often suggests itself. While thought continues to be forced down certain wrong turnings which had originally been taken, the search is vain; but with the cessation of strain the true association of ideas has an opportunity of asserting itself. And, similarly, it may be that while an effort to arrive forthwith at some answer to a problem, acts as a distorting factor in consciousness and causes error, a quiet contemplation of the problem from time to time, allows those proclivities of thought which have probably been caused unawares by experiences, to make themselves felt, and to guide the mind to the right conclusion.

It is with the multitudinous incidents of daily life as it is with the multitudinous seeds of a plant: almost all of

them end without progeny. But, occasionally, an incident differing in no conspicuous way from the barren ones, becomes the parent of some important series of events. Already the preceding two years had furnished sundry examples; and now came another.

When agreeing to publish the "Theory of Population" in *The Westminster Review*, I stipulated with Chapman that a small edition should be struck off from the type, and that two months after the first appearance of the article, I should be allowed to republish it as a pamphlet with my name. This was done; and in June, when it was thus republished, I distributed a number of copies to leading men: acknowledgments being, of course, the only apparent results. With a copy sent out later, however, the result was different. Among those who attended the meeting of the British Association in 1852, was a biologist then known to but few, Mr. T. H. Huxley. One of the medical staff at Haslar, his scientific proclivities had caused his appointment to the post of assistant surgeon on board the *Rattlesnake*, when its officers were commissioned to make a survey of the "inner passage" on the Eastern coast of Australia. The *Rattlesnake* had recently returned; and Mr. Huxley was then waiting until there came the needful grant, enabling him to publish the results of his researches. Among the papers read at the meeting of the Association, was one by him concerning certain of the oceanic *Hydrozoa;* and some of the facts stated in it, appeared to support the arguments contained in the "Theory of Population, &c." I was consequently prompted to send him a copy of the pamphlet; accompanied, I presume, by a letter. The result was that he called on me at *The Economist* office, and that I returned his call at his lodgings in St. John's Wood. There thus commenced an acquaintanceship, growing presently into a friendship, which became an important factor in my life.

Professor Huxley is so well and widely known through

the various official functions he has discharged, by his lectures and addresses, by his scientific papers, and by his books and essays on various subjects, that it would be absurd for me to say anything about him in his public capacity. I will remark only that he furnishes a disproof of that belief, held by the great majority of people, that a man can be good only in some one department of thought or action adopted as a speciality. He, contrariwise, lends some colour to the dictum—quite untenable, however—that genius is a unit, and, where it exists, can manifest itself equally in all directions. While so omnivorous as a reader that nothing comes amiss to him from a fairy tale to a Biblical criticism or a metaphysical discussion, he is no less versatile as a thinker: receptivity and originality being in him associated, though very frequently divorced.

To those who know him simply as scientific lecturer and writer, he presents only the graver side of his character; though reports of his after-dinner speeches might show even these that he has a fund of humour. To his friends, however, he is known as a sayer of good things—some of them things which, though forgotten by himself, are remembered by others. A witticism of his at my expense has remained with me these twenty years. He was one of a circle in which tragedy was the topic, when my name came up in connexion with some opinion or other; whereupon he remarked—"Oh! you know, Spencer's idea of a tragedy is a deduction killed by a fact." On another occasion Lewes gave him an opportunity. I had invited some half dozen leading men to meet an American friend at dinner. In the course of the evening a conversation arose about habits of composition: some describing the difficulty they had in getting into the swing of it, and others saying they found it easy at the outset. Lewes, one of the last, said—"I never hesitate. I get up the steam at once. In short, I boil at low temperatures." "Well, but," remarked Huxley, "that implies a vacuum in the upper regions."

There are two faults he has which I ought to set down, however. One is that he is too yielding. I do not mean that he is what Emerson somewhere calls "a mush of concession": far from it. He is about the last man I should think of as likely to give up the point in argument, or be persuaded to abandon a course he had decided upon. Nevertheless, there is a sense in which he is, as I say, too yielding. For if he is asked to undertake anything, either for the benefit of an individual or with a view to public benefit, he has difficulty in saying no. The temptation to assent is commonly too much for him.

The other fault, naturally a sequence of the first, is that he habitually works too hard; for of course each of these concessions from time to time made, brings an addition to the burden of engagements. I have sometimes described him as one who is continually taking two irons out of the fire and putting three in; and necessarily, along with the external congestion entailed, there is apt to come internal congestion. A heavy adverse balance accumulates in Nature's ledger, which has to be settled sometime and somehow; for Nature is a strict accountant.

But how can I comment on this undue yieldingness and undue devotion to work which follows it; having myself often sinned by betraying him into them? Many a time he has been occupied in giving me the benefit of his criticisms, when there needed, instead, some relaxation or amusement.

In the last chapter but one, I have referred to an essay on "Force of Expression" which had been written, I think, about the beginning of 1844, and had been declined by the editor of a periodical to which I sent it—*Tait's Magazine*, I believe, now long since deceased. I cannot remember what it was which first turned my attention to the subject of style; but it is probable that some hypothesis suggested to me by a few instances, prompted

that reading of books on composition which I entered upon, and found nothing satisfactory—nothing but dogmas and empirical rules, which of course did not content one who in all cases looked for principles. There resulted from the study which followed, an attempt to explain the general cause of force in expression.

This essay, or rather a revised and developed version of it, I proposed for *The Westminster Review*; and, occupying part of the early autumn in re-writing it, published it in October, after re-naming it "The Philosophy of Style." The change was not of my desiring, but resulted from the editorial wish to have something more taking than "Force of Expression." As I had been thus prompted to use too comprehensive a title, it was half amusing half annoying to hear from the editor after its publication, the criticism that the essay contained only the backbone of the subject. It was only the backbone of the subject with which I professed to deal, and which the original title covered.

Few would expect to find such a subject as style dealt with on physical principles. The first of the two theses set forth and variously illustrated, was that nervous energy is used up in the interpretation of every one of the symbols by which an idea is conveyed; and that there is greater or less expenditure of such energy according to the number of the symbols, their characters, and their order: the corollary being that in proportion as there is less energy absorbed in interpreting the symbols, there is more left for representing the idea, and, consequently, greater vividness of the idea. Otherwise stated, this thesis was that the most successful form of sentence is one which guides the thought of the hearer or reader along the line of least resistance: every resistance met with in the progress from the antecedent idea to the consequent idea, entailing a deduction from the force with which the consequent idea arises in consciousness. The second thesis was that since every element in the nervous system, like every other

active element in the organism, is wasted by action, it follows that each idea suggested, each conception framed, entails some exhaustion—now momentary, now more prolonged—of the nervous elements employed; and that they are consequently for a shorter or longer time partially incapacitated for action—rendered less able than before to produce in consciousness a feeling or idea like that which they have just produced. And the corollary drawn was that to achieve the greatest effect, the successive impressions must be so arranged that the earlier ones shall not, by greatly taxing them, have so diminished the sensibility of the structures brought into play, as to render them partially insensible to those later impressions which are more especially to be appreciated.

As is at once manifest, these theses are congruous with sundry of the maxims which writers on style enunciate. That which the essay did was to reduce these maxims from the empirical form to the rational form, and to point out further applications of the principle involved.

Let me add that in its closing paragraphs occurred the first sign that von Baer's formula, expressing the transformation passed through during the development of every organism, was in course of extension to other things. The essay ends with the statement that a perfect composition will "answer to the description of all highly-organized products, both of man and of nature: it will be, not a series of like parts simply placed in juxtaposition, but one whole made up of unlike parts that are mutually dependent"—(the conception of progress set forth in *Social Statics,* pp. 451-55). And on the adjoining page there is the partially-equivalent statement that progress in style "must produce increasing heterogeneity in our modes of expression."

Of minor things written during the year, I may here mention sundry of the Haythorne Papers—"Use and

Beauty," "The Development Hypothesis," already named, "The Origin of Architectural Types," "A Theory of Tears and Laughter," "Gracefulness."

To complete the account of the year I must add some of the secondary incidents which gave the seasoning to my daily life.

Two of my weekly vacations were spent at the sea side; and, later on in the season, I had a few pleasant days with Miss Evans's friends, the Brays, at Coventry; who, as well as Miss Hennell, thereafter became friends of mine. There were, too, some more summer rambles with Lewes—one of them being in Windsor Park and its neighbourhood, where we spent two days in sauntering and talking: a result being a brief essay by Lewes in the "Portfolio" of *The Leader*, under the title—"Amid the Ferns."

Beyond those already given in one or other connexion, I find in letters a few passages of sufficiently impersonal interest to admit of quotation.

"I called on Leigh Hunt on Tuesday. I like him much. I am to go and take tea with him shortly. He has read S. S. twice." (12th March.)

I may join with this the fact that he asked me to read the MS. of his *Religion of the Heart*—a work with the aims of which I felt much sympathy.

"I was at the ceremony of raising the first column of the New Crystal Palace yesterday. It was a grand affair. I saw and talked with a good many people I knew; and spent a pleasant time. The new palace will be magnificent —far transcending the other." (August 6.)

Since the season of 1851 I had known Mr. F. O. Ward, one of the active sanitary agitators of that day, who wrote the sanitary leaders in *The Times*. I had attended some of his literary breakfasts and met there sundry notabilities. He had a scheme for supplying London with water from certain gathering grounds near Farnham, and, in furtherance of his scheme, twice collected there groups of scientific men and others. I was at one of his parties: Louis Blanc,

I remember, being among those present. Here is an account of another of them:—

"I met Kingsley the other day—the author of "Alton Locke," "Yeast," the "Saint's Tragedy," &c. He is a capital fellow; I might with propriety say a *jolly* fellow. We met at a pic-nic. No one would suspect him of being a clergyman. We had a great deal of talk together . . . He is evidently a man of immense energy. He seems to have so much steam that he can scarcely sit still. He said that if he could be doing something whilst asleep it would be a great gratification. He stammers in conversation, but not, they say, in preaching. I do not know what to think of his opinions, nor does anyone else. He said amongst other things that he believed that man, as we know him, is by no means the highest creature that will be evolved. I took this as an admission of the development hypothesis; but am not sure that he meant it as such." (September 10.)

"I have had an anonymous Christmas-box in the shape of a six-guinea microscope. It came on Christmas eve. I have been to the opticians but can only make out that it was paid for and ordered to be sent to my address by a gentleman of 40 or 50, and that he requested that no answer should be given to any questions that might be asked. I am puzzled. It must evidently have been some one who knew either directly or indirectly that I was wishing for a microscope." (30 December.)

I found good reason to conclude that the gentleman of 40 or 50 was an intermediary: the donor knowing that I should object to receive the present had it come in a direct or avowed way.

This incident did not go far, however, towards mitigating certain saddening influences under which the year closed for me. The nature of them will appear in the course of the next chapter.

CHAPTER XXVIII.

LEAVE *THE ECONOMIST.*

1853. Æt. 33—34.

Why did I continue so long to hold a subordinate place? Letters written shortly after accepting it, imply that I originally regarded it as a place which very well served "present purposes;" and one of them dated April 1849, said I "shall probably retain my post until the completion and publication of my book." Two years had now elapsed since its publication, and yet I still remained where I then was.

During the autumn of the preceding year, however, the propriety of taking a step in advance became manifest: the success of *Social Statics*, and of articles published in *The Westminster Review*, being the warrant. In a letter home dated 20 October 1852, there occurs the passage:—

"I am thinking of preparing an article for the *Edinburgh Review* and getting Mr. Greg, who is one of their chief contributors, to present it. The subject I think of choosing is "Method in Education." It is considered by several of my friends that I am throwing away my time in my present position, and that I might with less exertion make more money by original contributions; and at the same time have as much leisure for larger works. . . . This article for the *Edinburgh* will be a kind of experimental test of the safety of the move."

And then a letter of the 27th, replying to one which expressed disapproval of the step, contains the passage—

"I have entertained the wish for the last year or more, and have done nothing towards realizing it yet, because I did not see my way. When I have tried the experiment with the *Edinburgh* and the other quarterlies, I shall be in a position to decide."

My experiences as a rolling stone had, I doubt not,

rendered me less ready to detach myself from a fixed position, and run the consequent risks, than I might otherwise have been. Consciousness that my official duties were light in comparison with the drudgery which I might be committed to did I enter upon an uncertain career, was perhaps also a deterrent. The motive which, I believe, chiefly prompted the wish to change, was not that of "getting on," in the ordinary sense, but that of obtaining the "leisure for larger works" referred to above—leisure which seemed unobtainable while I remained sub-editor of *The Economist.* One of my letters names the estimate that three days a week spent in review-article writing, would suffice to give me a sufficient income for my modest needs: leaving the rest of the week for writing the books I contemplated. For a time, however, my caution overruled my ambition. 1852 ended, and a considerable portion of 1853 elapsed, without witnessing any overt step in furtherance of my remoter aims; and I do not know how long such a step might have been postponed, in the absence of an event which introduced a new factor into my calculations.

When will education include lessons on the conduct of life? It is true that religious teachings and moral injunctions cover a part of the subject. It is true that many things which men like to do are peremptorily interdicted—some of them rightly, some without due reason. It is also true that men are exhorted to do many things which they dislike —now properly, now improperly. But these forbiddings and commandings leave unnoticed a great variety of actions. There is much in the conduct of life which turns simply upon considerations of policy; and has to be settled by estimations of costs and values.

I knew a gentleman—a man of great energy, full of resource, and with high ideals—who built himself a country house. Liking to have everything done in the best way, which was often a new way, he would not permit the work

to go on in his absence; and he was able to be present only four or five months in the year. The result was that the house took ten years to complete. He, his wife, and adult family, were kept waiting for it some eight years longer than they need have been; and he, being of good age at the time, had but some ten years' enjoyment of it before he died, instead of nearly twenty. Here, then, is an example of what I mean by error in the conduct of life.

"Is the game worth the candle?" is a question which should be often raised and well-considered. Multitudinous schemes are entered upon by men without counting the costs in time, in trouble, in worry; and without asking whether what may be gained will duly compensate for what must be paid—whether the amount of life absorbed in attention, thought, and effort, will bring adequate reward in the achieved exaltation of life for self and others; and whether some other expenditure of spare energy would not bring much greater returns of happiness, egoistic or altruistic, or both. If means and ends were duly weighed against each other beforehand, many a one, for example, would decline to spend weary years of toil and anxiety in accumulating a fortune, with the view of achieving social success. If he rightly estimated the value of the success when achieved—if he learned, as he might, how comparatively small are the pleasures it brings, and how many are the vexations and disappointments of those who labour on the social treadmill, he would decide not to make the required sacrifices.

But by far the most serious, as well as the most general, error which results from not deliberately asking which are means and which are ends, and contemplating their respective worths, we see in the current ideas about the relation between life and work. Here, so profound is the confusion of thought which has, by a combination of causes, been produced, that the means is mistaken for the end, and the end is mistaken for the means. Nay, so firmly established

has become the inversion of ideas, that that which, looked at apart from the distorting medium of custom, is seen to be a self-evident error, is, by nearly all, taken for a self-evident truth. In this case their sacred and secular beliefs unite in misleading men. "Work while it is called to-day, for the night cometh when no man can work," is a Scriptural injunction which, in the most unmistakable way, implies that work is the end and life the means. And daily conversations show that the industrialism of modern life has so strongly associated the ideas of duty and labour, that a man has come to be regarded as the more praiseworthy the harder he toils; and if he relaxes greatly in his activities, it is tacitly assumed that some apology or explanation is needed. But the whole thing is a superstition. Life is not for work, but work is for life; and very often work, when it is carried to the extent of undermining life, or unduly absorbing life, is not praiseworthy but blameworthy. If we contemplate life at large in its ascending forms, we see that in the lowest creatures the energies are wholly absorbed in self-sustentation and sustentation of the race. Each improvement in organization, achieving some economy or other, makes the maintenance of life easier; so that the energies evolved from a given quantity of food, more than suffice to provide for the individual and for progeny: some unused energy is left. As we rise to the higher types of creatures having more developed structures, we see that this surplus of energy becomes greater and greater; and the highest show us long intervals of cessation from the pursuit of food, during which there is not an infrequent spontaneous expenditure of unused energy in that pleasurable activity of the faculties we call play. This general truth has to be recognized as holding of life in its culminating forms—of human life as of all other life. The progress of mankind is, under one aspect, a means of liberating more and more life from mere toil and leaving more and more life available

for relaxation—for pleasurable culture, for æsthetic gratification, for travels, for games. So little, however, is this truth recognized, that the assertion of it will seem to most a paradox. The path of duty is identified in their minds with devotion to work; quite beyond the amount which is needed for maintaining themselves and those dependent on them and discharging their shares of social obligations. So much is this the case, that you may often see a busy man already half invalided by ceaseless toil, persisting spite of the expostulations of his family and advice of his friends, in daily making himself worse by over-application. Reduced to a definite form, the conception current among such may be briefly expressed in the formula—Business must be attended to: Life is of secondary importance.

Why do I introduce here these seemingly irrelevant remarks? I do it because they are relevant to the case of my uncle Thomas, who illustrated the fatal results of this wrong theory of life.

In early days his constitution had been considerably shaken by hard work at Cambridge. Letters which I have recently re-read between him and my father, comparing their symptoms, remind me that excess of study in obtaining his wranglership and his fellowship, had established a state of ill-health like that which had been established in my father by excess of teaching, though not so extreme. And his nervous collapse, like nervous collapses in general, was never wholly recovered from; though he regained tolerable health.

And now, when between fifty and sixty, his system, unduly strained in preaching, lecturing and writing, began to yield in serious ways. Already in the autumn of 1849, a severe bronchial affection rendered chronic by his debility, had sent him to the hydropathic establishment at Umberslade, then kept by Dr. Edward Johnson (a sensible

physician who had written a popular work entitled *Life, Health, and Disease*)who brought him round. No due heed was taken of this broad hint, however. Writing to my father on 24th January, 1852, my aunt says :—

"He has been overtaxing his brain by writing, and public meetings, so as hardly to allow himself proper time for his meals."

Resulting head symptoms took him again to Umberslade, where the causes of mischief were duly set before him, and he was warned that rest was required to bring him round. He was deaf to the advice, however. A letter of mine of February 18th says :—

"Since his return from Umberslade he has been continuing his work in spite of his evident unfitness, and on Friday last he was seized with a partial paralysis of one side of the face."

And this was accompanied by acute cerebral symptoms which Dr. Bright, a distinguished physician of that day whom I summoned, feared would end in apoplexy. He struggled through, however, and in a letter of 7th March there are the words—"My uncle is slowly improving. It is now merely a matter of time."

I see that when writing home while this attack was impending I have remarked that—

"My uncle with his writing is just as bad as a drunkard with his liquor. It is the only gratification he has, and he cannot keep from it. It seems of no use talking to him."

Not only, as thus said, were expostulations useless; but experience also seemed to be of no avail. On recovering from this attack which endangered his life, he partially resumed his previous habits; and, relapsing again in the course of the autumn, was seized in December with a complication of diseases which ended fatally before the close of January, 1853.

Thus prematurely ended a career which, but for these errors in the conduct of life, might have lasted for another twenty years; with benefit to society and happiness to himself in the furthering of it. But my uncle was one of those in whom religious belief, current opinion, and personal habit, united to confirm the tacitly accepted

notion that life is for work. Carrying to an extreme the expenditure of energy in labours of one or other kind, he had, as often happens in such cases, lost all taste for other modes of occupying time and attention; so that when there came the need for relaxation, relaxation was impracticable. Due participation in the miscellaneous pleasures of life, would have made his existence of greater value, alike to himself and to others.

He was taken to Hinton to be buried; and the profound respect in which he was held there, was shown by the fact that the parishioners spontaneously organized a public funeral.

Under my uncle's will, I was left co-executor with my aunt. Of course the business of carrying out its provisions devolved almost wholly upon me, and much time early in the year was occupied by it.

By another clause my uncle bequeathed me £500. As I was also named as one of three residuary legatees—my aunt, my father, and myself—there eventually came to me in this capacity a small addition.

Being thus placed pecuniarily in a different position, the step I had been contemplating no longer appeared so questionable a one. With a considerable sum in hand, there was manifestly much less risk in resigning the sub-editorship of *The Economist*; and, consequently, in April, I intimated to Mr. Wilson that I should not continue to hold the post beyond the beginning of July.

Meanwhile I took steps to extend my literary connexions. Through the good offices of Mr. Lewes and Mr. David Masson—now Professor at Edinburgh but then resident in London—I established relations with *The British Quarterly Review* and *The North British Review:* the last a since-deceased quarterly organ of the Free Church.

As indicated in a previous chapter, the title of one

division of the work on Psychology which I contemplated, was "The Universal Postulate." The subject-matter to be dealt with under this title, was the ultimate test withstood by those propositions which we hold to be unquestionably true. Early in the year I agreed to prepare an article for *The Westminster Review* on the subject.

It was when reading the *System of Logic* of Mr. J. S. Mill, that I was led to take, partly in opposition to him, the view I proposed to set forth. In passages controverting the doctrine enunciated by Dr. Whewell, he had, as it seemed to me, ignored that criterion of belief to which we all appeal in the last resort; and further, he had not recognized the need for any criterion.

This essay may be instanced as an early illustration of that tendency towards analysis, which, in me, accompanied the more predominant tendency towards synthesis. *Social Statics* had exemplified this. Its general aim was to disentangle and set forth that ultimate truth concerning social relations from which all special forms of equitable arrangements may be deduced: there was a process of analysis that there might be a more satisfactory synthesis. So was it, too, with the "Theory of Population, &c.," as set forth in the article already named. Not by deliberate search, but incidentally, I was led to recognize the fact which may be asserted in common of the rates of multiplication of living things. The general law which analysis disclosed was that individuation and reproduction are antagonistic. And this being the law analytically reached, there were reached, synthetically, certain conclusions respecting human population. Nor was it otherwise with the essay on the "Philosophy of Style." Various empirical statements and maxims about composition were current:—Metaphor is better than simile; the inverted form of sentence is more effective than others; words native to our tongue produce impressions exceeding in vividness those produced by words of Latin origin; the poetical form is more forcible than the

prosaic; and so forth. Is there not a common cause? was the question. And, as lately said, analysis made it manifest that those are the most effective modes of expression which absorb the smallest amount of the recipient's attention in interpreting the symbols of thought: leaving the greatest amount for the thought itself.

That this way of proceeding had been habitual with me, is a fact of which I have only now become distinctly conscious, on being prompted by observing that it is exemplified in "The Universal Postulate," to go back upon previous writings to see whether it was exemplified in them. Again, as I say, not with conscious intention but from unconscious bias, there occurs this search for an ultimate element which gives community of character to things superficially different. A weight falls on my toe, and that I am pained is a truth of the highest certainty. If I left three books on the table, and find but two on my return, there results in me a conviction, which I cannot change, that one has been in some way or other abstracted. While my eyes are suffering from the glare of an electric light, no effort enables me to think that I am then and there looking into darkness. A straight road is made between two villages which before were united only by a crooked lane, and I find myself compelled to believe that the new way is shorter than the old. I accept the statement that action and re-action are equal and opposite, because no alternative is open to me. Here, then, are beliefs in most respects of widely unlike kinds—beliefs concerning a pain, a numerical implication, a visual sensation, a geometrical truth, a mechanical axiom—which are nevertheless alike in their absoluteness. What constitutes this absoluteness? What makes me ascribe to them a certainty which is not to be exceeded? I can give no warrant for any one of them except that it cannot be changed. The test by which, in the last resort, I determine whether a belief is one I must perforce accept, is that of trying whether it is possible

to reject it—whether it is possible to conceive its negation. In other words, the inconceivability of its negation is my ultimate criterion of a certainty. And that it is impossible by any process of reasoning to get below this, is manifest on remembering that for acceptance of every step in a process of reasoning, the warrant is that negation of it is inconceivable.

I may remark as a curious fact that though, since the time when this essay was written, various objections have been made to the criterion of certainty set forth in it, no other criterion has been proposed. Those who have demurred to the test have none of them contended for any other test: the apparent implication being that they think no test is required. One might have supposed that as a needful preliminary to a systematic discussion—especially a discussion concerning the nature of things—the disputants would agree on some method of distinguishing propositions which must be accepted from propositions which it is possible to deny. May not one fairly say that those who decline to accept a test proposed, and also decline to furnish a test of their own, do so because they are half conscious that their opinions will not bear testing?

About this time a rising man of science, then known only to the select but now widely known, had produced a sensation by a lecture at the Royal Institution—a lecture in which, in presence of Faraday who had denied the existence of dia-magnetic polarity, he proved that dia-magnetic polarity exists—I mean Mr. Tyndall, soon afterwards made Professor Tyndall. In the course of the Spring we were introduced by one who presently became Professor Huxley.

It is said of Keats that on one occasion after dinner, he proposed some such sentiment, as "Confusion to Newton." I say some such sentiment, because he was not likely to wish confusion to a deceased man. But these words indicate the feeling he displayed. The reason he gave

was that Newton had shown the rainbow to be caused by the refraction of light through rain drops, and had thus destroyed the wonder of it. Keats did but give a more than usually definite expression to the current belief that science and poetry are antagonistic. Doubtless it is true that while consciousness is occupied in the scientific interpretation of a thing, which is now and again "a thing of beauty," it is not occupied in the æsthetic appreciation of it. But it is no less true that the same consciousness may at another time be so wholly possessed by the æsthetic appreciation as to exclude all thought of the scientific interpretation. The inability of a man of science to take the poetic view simply shows his mental limitation; as the mental limitation of a poet is shown by his inability to take the scientific view. The broader mind can take both. Those who allege this antagonism forget that Goethe, predominantly a poet, was also a scientific inquirer. Nor are converse cases wanting. Prof. Tyndall is chiefly distinguished as a scientific inquirer; but among those who are classed as poets because they write verses, there are probably few who have an equally great love of beauty. Every year dwelling as long as the weather allows in his châlet on the Bel Alp, having the peaks of the Oberland ever before him, and then migrating to his English retreat on Hind Head, with its wide sweep of landscape, he displays a passion for Nature quite Wordsworthian in its intensity.

Another trait, not perhaps wholly unallied with this, is to be noted. The ordinary scientific specialist, deeply interested in his speciality, and often displaying comparatively little interest in other departments of science, is rarely much interested in the relations between Science at large and the great questions which lie beyond Science. With Prof. Tyndall, however,—and it is equally so with Prof. Huxley—one of the chief interests in Science is its bearings on these great questions: the light it throws on our own nature and the nature of the Universe; and the

humility it teaches by everywhere leaving us in presence of the inscrutable. The dull world outside thinks of Science as nothing but a matter of chemical analyses, calculations of distances and times, labelings of species, physiological experiments, and the like; but among the initiated, those of higher type, while seeking scientific knowledge for its proximate value, have an ever-increasing consciousness of its ultimate value as a transfiguration of things, which, marvellous enough within the limits of the knowable, suggests a profounder marvel that cannot be known. Various lectures and addresses of Prof. Tyndall have shown how much this conception of Science influences him.

Though that performance of feats in Alpine climbing, which has familiarized his name to many who know nothing of his scientific work, is by some ascribed to the feeling which would—

"Pluck bright honour from the pale-faced moon,"

yet those who know him intimately see in it two other traits:—one of them being a certain fascination which climbing in general has for him; and the other being a deep-seated resolve to keep the lower nature with all its desires and fears, subject to the commands of a determined will. Joined with his Irish warmth, this may be an element in his chivalrous tendency to take up the cause of any one he thinks ill-used. The disregarded priority of M. Rendu, the Swiss bishop, in the interpretation of glacier-motion, found in him an expositor. He set forth the claims of the German physician, Mayer, to an early publication of the doctrine of equivalence among the physical forces. The great discoveries of Young, discredited during his life by one whom people foolishly regarded as an authority—Lord Brougham—have been more than once eloquently set forth by him. And at great personal cost, he energetically fought the cause of an inventor unfairly treated by officials —Mr. Wigham. In one case only, not among these, did I

differ from him as to the worthiness of the object of his sympathies, similarly enlisted.

Do I mean myself? Well no; though my name should be included among the names of those who have benefited by his desire to see justice done, yet it is scarcely in the nature of things that I should in this case disagree with him as to the propriety of his efforts.

In its early days, while directed by Mill and aided by Molesworth, *The Westminster Review* had been an organ of genuine Liberalism—the Liberalism which seeks to extend men's liberties; not the modern perversion of it which, while giving them nominal liberties in the shape of votes (which are but a means to an end) is busily decreasing their liberties, both by the multiplication of restraints and commands, and by taking away larger parts of their incomes to be spent not as they individually like, but as public officials like. In pursuance of its genuine Liberalism, *The Westminster Review* had reprobated the excesses of Government-meddling; and this traditional policy Chapman willingly continued. Knowing my views on this matter, he asked me to write an article setting them forth; and I gladly assented.

Why say anything about this article, considering how familiar these views of mine are? Well, there are several reasons. First, that it is well to note the earlier phases of these views; second, that inattention has to be overcome by iteration and re-iteration; and third, that with some, a succinct statement of theses tells more than a full exposition crowded with illustrations.

The incidents of our private lives often prove to us the fallibility of our judgments—our "best laid schemes . . . gang oft agley." How then can we be so very confident about our schemes for public welfare, in respect of which our judgments, because of complicated data, are so much more liable to err. And should not our hesitation be

immensely increased on contemplating the blunderings of our ancestors, seen in the almost countless statutes which century after century have been passed and repealed after severally doing mischief. Again, why should we hope so much from State-agency in new fields, when in the old fields it has bungled so miserably? Why, if the organizations for national defence and administration of justice work so ill that loud complaints are daily made, should we be anxious for other organizations of kindred type? And conversely, why, considering that private enterprise has subdued the land, built the towns, made our means of communication, and developed our civilized appliances at large, should we be reluctant to trust private enterprise in further matters? Why slight the good and faithful servant and promote the unprofitable one from one talent to ten? Human desires are the motive forces from which come all social activities. These desires may use for their satisfactions *direct* agencies, as when men individually work to achieve their ends, or voluntarily combine in groups to do it; or they may use for their satisfactions *indirect* agencies, as when electors choose representatives, who authorize a ministry, who form a department, which appoints chief officials, who select subordinates, who superintend those who do the work. Among mechanicians it is a recognized truth that the multiplication of levers, wheels, cranks, &c., in an apparatus, involves loss of power, and increases the chances of going wrong. Is it not so with governmental machinery, as compared with the simpler machinery men frame in its absence? Moreover, men's desires when left to achieve their own satisfactions, follow the order of decreasing intensity and importance: the essential ones being satisfied first. But when, instead of aggregates of desires spontaneously working for their ends, we get the judgments of governments, there is no guarantee that the order of relative importance will be followed, and there is abundant proof that it is not followed. Adaptation to one function

pre-supposes more or less unfitness for other functions; and pre-occupation with many functions is unfavourable to the complete discharge of any one. Beyond the function of national defence the essential function to be discharged by a government is that of seeing that citizens in seeking satisfactions for their own desires, individually or in groups, shall not injure one another; and its failure to perform this function is great in proportion as its other functions are numerous. The daily scandals of our judicial system, which often brings ruin instead of restitution and frightens away multitudes who need protection, result in large measure from the pre-occupation of statesmen and politicians with non-essential things, while the all-essential thing passes almost unheeded.

Such were some of the leading propositions set forth in the article on "Over-legislation." I am reminded by a letter that Mr. Samuel Morley, widely known in later times as one who spent his money freely for public objects, asked permission to re-publish the article in a separate form. Chapman demurred for the reason that re-publication would be injurious to the *Review*. Not long afterwards, however, with my assent, he issued it in a separate form himself, in his "Library for the People:" Mr. Morley agreeing to take part of the edition.

The close of my engagement at the beginning of July, came, as it appears, not inopportunely; for letters show that my health had been a good deal shaken by the extra work of the half year. An executorship, even when a will is not complicated, entails many transactions and a good deal of correspondence. With this necessitated business had been joined the writing of the two above-described articles—the last of them under some pressure as to time. Added to my routine official work, these had proved a little too much for me, and relaxation had become needful.

Remembrances of these years of my journalistic life, are

agreeable. Light work and freedom from anxiety made my daily existence a not undesirable one; and some kinds of pleasures were accessible in ample amounts. The period was one in which there was going on an active development of thought. There then germinated various ideas which unfolded in after years; and of course the rise of these ideas, and in some cases the partial elaboration of them, had their concomitant gratifications of a sustained kind. Moreover, during this interval my existence became much enriched in another way. To the friendships of previous years were now added five others, which gradually entered as threads into the fabric of my life; and some of which affected its texture and pattern in marked ways. In short, I think I may say that the character of my later career was mainly determined by the conceptions which were initiated, and the friendships which were formed, between the times at which my connexion with *The Economist* began and ended.

PART VII.

CHAPTER XXIX.

TWO MONTHS HOLIDAY.

1853. Æt. 33.

Except for ten days at Christmas 1851—2, I had not been absent from London more than four days at a time since the autumn of 1848: a period of nearly five years. Naturally, therefore, as the close of my engagement approached, plans were laid for utilizing my freedom by visits and tours.

During the spring it had been arranged that I should spend a fortnight with the Potters immediately after my release. They had just migrated to a new residence near Stonehouse, named Standish House, owned by Lord Sherborne, and at one time inhabited by him. It stands on the flank of the Cotswold Hills, facing the west. Behind, separated from the grounds by a ha-ha, a large park-like field running up the side of the hill, is bounded by an amphitheatre of beech trees. In front lies a broad valley, on the far side of which, some ten miles off, is to be seen, when the tide is up, the silver streak of the Severn estuary. Beyond this lie high lands: on the right, in the dim distance, the Malvern Hills; far away to the left the hills of South Wales; and in front the Forest of Dean, over which gorgeous sunsets are often to be witnessed.

I have thus briefly described the surroundings of Standish House because, during the succeeding thirty years —in spring, summer, autumn, winter—very many happy times were passed under its hospitable roof. During this first visit there was the added charm of novelty. A walk

up through the beech woods to the top of the high ground behind, brought into view the Vale of Stroud, with, to me, its bitter-sweet memories; and, running out of it in various directions, branch valleys, with here and there a village nestling in a fold of the hills. Then there was Beacon Hill, a spur of the Cotswolds; and the adjacent picturesque region known as Standish Park. Now first explored, these, and many other neighbouring scenes at that time unvisited, were in after years places for pleasant excursions: mostly walking, sometimes driving, and rarely riding.

Of course indoors our lighter conversations were interspersed with discussions. Probably on this occasion, as on many occasions, there cropped up what was becoming more and more dominant in my thoughts—the development hypothesis. It was at that time rare to find anyone who entertained it; and my friends habitually met the expression of my belief with a tolerant smile.

On returning to town towards the close of July, a few days were occupied in preparations for a tour in Switzerland. During the spring I had agreed with Lott that we should visit it in company. "I will go to heaven with you," he wrote in one of his letters: so expressing his passionate love of scenery. When the time fixed for our departure came, he was detained by business; and, finding after some days that the detention would be considerable, I, anxious to get away, partly on grounds of health, decided to start in advance and await him at Zurich.

Why give any account of our journey? All who have not been in Switzerland have read about it; and only special genius for description, or else an endowment of humour great enough to evolve amusement out of familiar things, would be an adequate excuse for the narrative. I will limit myself to the briefest outline.

My first acquaintance with the Continent was made at Antwerp; whence, having just time to see the cathedral

and Rubens's picture, I departed for Aix-la-Chapelle. Early next day to Cologne; and, after an hour or two spent chiefly in its then unfinished cathedral, by steamer to Coblentz. On to Maintz and Frankfort next day; feeling a good deal disappointed with the picturesque part of the Rhine. Two nights and a day at Frankfort were made miserable by my first attack of tooth-ache, after an immunity of thirty-three years. Thence to Basle; and thence, after a day, to Zurich. Here I spent a week or so; and then, when the time for my friend's arrival had been exceeded by some days, I got impatient, and left a letter for him at the post-office telling him that he would find me at the top of the Rigi. Two days' walk brought me there; and he joined me within a few hours of my arrival. The successive journeys of our subsequent days ran thus:—Along the Lake of Lucerne to Fluelen and Amsteg; to Andermatt and Hospenthal; the Furca Pass and up to Furca-horn; over the Rhone Glacier, up the Grimsel Pass, and down to the Handeck Falls; to Meyringen; over by Rosenlaui to Grindelwald; up the Faulhorn; down again, and up the Wenger Alp; to Lauterbrunnen and Interlachen; a day's rest; by steamer to Thun, and by carriage to Frutigen; over the Gemmi to the baths of Leuk; by carriage to Visp and on foot to Stalden and Nicolai; to Zermatt; a day on the Gorner glacier; up the Riffelberg and Gorner Grat and down; back to Nicolai; back to Visp. Here ended our pedestrian tour. A diligence took us to Vevay and to Basle; the railway thence to Mannheim; steamer down the Rhine to Cologne; railway to Brussels; where my friend left me, and where I spent a few days before returning to London.

I suppose I must say something about the impressions our tour left. My first remark is that we committed the usual error. With an insatiable appetite for scenery and a definitely limited holiday, my friend Lott was constantly a

spur; and instead of seeing a moderate amount and seeing it well, we saw a great deal hurriedly.

But what were my impressions? Two unlike answers would seem to be given by two extracts from letters, either of which is misleading if taken by itself. The first is from one written to my father after my return.

"I was much disappointed from the absence of fine colouring. Grey and green and brown are the prevailing tints. In consequence of the clearness of the air there is very little atmospheric effect, and a general absence of those various tones which this gives. In this respect Switzerland is *far inferior* to Scotland. I remember Jackson expressing the opinion that for pictorial effect Scotland was far preferable; and I quite agree with him."

The other is from a letter to my uncle William, hurriedly written in pencil, and dated "Top of the Faulhorn, 8000 and odd feet above the sea, 22 Aug. 1853." This, though it avows no impression, indicates one.

"Here I sit surrounded by a vast panorama of mountains and lakes—on one side the comparatively fertile, inhabited part of Switzerland, on the other the peaks of the high Alps, varying from 10 to 15 thousand feet high, covered with snow and hourly sending down avalanches which send a peal of thunder across the valley seven to ten miles wide, lying between us and these giants of the Alps. From my bedroom window I see at one view the Wetterhorn, the Shreckhorn, the Finsteraarhorn, and the Jungfrau. The nearest is seven miles off, the furthest thirteen; yet so clear is the air and so vast are the heights that they all of them look within two miles."

The reconciliation between the different feelings implied by these different extracts, is furnished by a sentence which precedes the first of them.

"On the whole, though Switzerland fully equalled my anticipations in respect of its grandeur, it did not do so in respect of its beauty."

Beauty is deficient both because there is a lack of the warmer and brighter colours and because the forms do not compose well—the lines do not combine picturesquely. But this deficiency of beauty leaves the grandeur undiminished. After a time during which is acquired some power of interpreting the impressions made on the senses, unfamiliar with scenes of such vastness, there all at once comes a revelation; as when, while looking from the smaller mountains on one side of a valley at the great ones on the

other, which, instead of dwindling as we have ascended seem to have grown, a cloud comes drifting across their faces and over it their peaks suddenly rise to a height far above that which they previously seemed to have. "Nature is the circumstance which dwarfs every other circumstance," says Emerson; and there are few places in which the truth of the saying is more vividly felt than in presence of one of these immense snow-crowned masses which now and again makes the valleys reverberate by its avalanches.

The often-quoted remark of Kant that two things excited his awe—the starry heavens and the conscience of man—is not one which I should make of myself. In me the sentiment has been more especially produced by three things—the sea, a great mountain, and fine music in a cathedral. Of these the first has, from familiarity I suppose, lost much of the effect it originally had, but not the others.

To this brief indication of the mental impressions left by the tour, there has to be added something concerning the physical effects apparently produced by it.

Years before, I had read Andrew Combe's work *The Principles of Physiology applied to the preservation of Health*, and had duly accepted the warning given by him against excessive exertion on the part of those who, having previously led sedentary lives, attempt feats of walking and climbing. Yet, aware as I was of the possible mischiefs, I transgressed: not, however, as it seems, without excuse. In the above-named letter written on the Faulhorn, after urging my uncle to see Switzerland, I went on to say—

"There is however great temptation to do too much. The difficulty of getting tolerable accommodation save at certain places, often induces one to go too far, and spite of the feats which the Swiss air enables every one to do, Lott and I overdid ourselves a few days ago, in spite of my previously made resolution to avoid any excess of exertion. However we shall be more resolute in future."

Of three excesses in walking which I recall (the last

being subsequent to the date of the above-named letter, notwithstanding the resolution expressed in it) two were caused by misleading statements contained in Murray's Guide. This led us to arrange for stopping at places which, when we saw them, we instantly decided to avoid at the cost of two or three hours' more walking along rough roads and in partial darkness: previous experience having proved that nights made sleepless by fleas were the alternatives.

These details I set down as introductory to the statement that within a few days of my return to London, there began signs of enfeebled action of the heart. There was no mental cause. As said in a letter to my father, while in Switzerland "I cultivated stupidity assiduously and successfully;" and after my return it was some weeks before I got seriously to work.

Two distinguished physiologists have at different times assured me that the heart cannot be overtaxed; but, authoritative though their opinions are, I have found acceptance of them difficult. Among reasons for scepticism are these:—First, the improbability that there are no foundations for the many assertions that extreme exertion, as in rowing matches, sometimes leaves behind a long prostration. Second, there is the unquestionable fact that during states of debility the heart is easily over-taxed: the implication being that if, during an abnormal state, its limit of power may be exceeded, it may be exceeded during a normal state. Third, the truth that other organs have limits to their powers which cannot be over-passed without damage—damage sometimes ending in atrophy—seems scarcely likely to fail in the case of one organ alone. Fourth, such an exception does not seem reconcilable with the hypothesis of evolution; for how, by either natural selection or by direct adaptation, can any organ have acquired a never-used surplus of strength?

Be the interpretation what it may, however, here is

a fact, that immediately after my return from Switzerland, there commenced cardiac disturbances which never after wards entirely ceased; and which doubtless prepared the way for the more serious derangements of health subsequently established.

The record of my doings at this period will be incomplete if I do not mention a visit paid into Suffolk.

One of the places at which my uncle had, in 1852 I think, discharged for a time the duties of the absent clergyman, was Halesworth; and among those who were drawn from neighbouring places by the accounts of his preaching, was Mrs. Trevanion, one of the daughters of Sir Francis Burdett of political celebrity. A friendship with my uncle resulted, which was renewed during Mrs. Trevanion's sojourns in London. I suppose it was on one of my Sunday evening visits to him at Notting Hill that I first met her; though I cannot recall the occasion.

From my aunt it doubtless was that she heard of my religious opinions, and thereupon became concerned about my state and anxious for my conversion. She was an admirer of Dr. Cumming, one of the popular preachers of that day, and begged that I would accompany her to hear him. There was no escape for me: I had to yield. It is scarcely needful to say that none of the hoped-for effect was produced. While it raises a smile, there is something pathetic in the confidence with which those who have never inquired, think that those who have inquired and rejected, need but to hear once more the old beliefs duly emphasized to be convinced.

During the spring or early summer, it was arranged that after my return from Switzerland I should spend a fortnight with Mrs. Trevanion at her residence in Suffolk —Earl Soham Lodge, near Woodbridge. After nearly a month in London I left it to make the promised visit. The following extracts from a letter to my father, written

from Earl Soham on October 8, I quote chiefly because of the indications they give of engagements and intentions.

"The house is built on the ruins of an old castle and is surrounded by the moat that once guarded it. Part of the old walls of the moat still remain; so that it is sufficiently picturesque.

"Mrs. Trevanion had expected other visitors but has been disappointed; so I am here alone. I fear it will be rather dull. However I have a good deal of writing to do; and having a comfortable sitting room with fire put at my disposal, I shall devote myself to work, and pass the time in that way.

"I have agreed to write an article on 'Manners and Fashion' for the *Westminster*. They wish me to get it ready in time for the January No. in case they should want it; which however they are not sure of doing. Having this and the 'Method in Education' to finish by the middle of December, I shall have plenty to do. * * *

"I am going to give notice shortly to read a paper at the next British Association on the 'Law of Organic Symmetry.' I was speaking to Professor Forbes about it a few days ago, and he was advising me to fix on the first day of meeting, and says that he will see that it has a good place on the list."

My visit to Earl Soham I brought to a close as soon as I could, finding it, as I anticipated, very dull. Being nearly twenty years my senior, and having comparatively few subjects of interest in common with me, my amiable hostess did not prove an enlivening companion; and I had not liveliness enough for two. In various ways Mrs. Trevanion resembled her younger sister Lady Burdett-Coutts. In the one there was, as in the other there is, a union between interest in human welfare at large and interest in the welfares of those around, prompting frequent acts of kindness and attention. This is a trait much to be admired; for general philanthropy is often not accompanied by philanthropy in detail.

On the 17th of October I was back in London, and leaving it next day, I spent a week with the Brays at Coventry; whence I departed in time to reach home towards the close of the month.

CHAPTER XXX.

WRITING FOR QUARTERLY REVIEWS.

1853—54. Æt. 33—34.

THAT part of a biography which consists of printed gossip, having little or no significance, bears a variable ratio to that part which has significance more or less considerable. Commonly, the trivialities of incident and action, which might have been this way or that way without appreciably affecting the general result, occupy the larger space, and to many readers prove the most attractive; while relatively small interest is felt by them in those passages, occupying relatively subordinate places, which throw light on the genesis of character and belief and conduct.

Of course detailed personalities in considerable amount are indispensable; since, without them, the narrative of a life cannot have the continuity and cohesion required to give it the concreteness of reality. Of such details I have myself found it needful to set down many. But I have sought to give more prominence than usual to the delineations of ideas and the manifestations of sentiments; and I have aimed to show, directly or by implication, the relations of these to innate traits, to education, and to circumstances.

In the life of the man of action an account of external events naturally occupies the first place; but in the life of the man of thought the first place should, I think, be occupied by an account of internal events. Not the origin

and description of deeds is now the thing of chief import, but the origin and description of doctrines. Hence I have not scrupled to devote from time to time considerable space to digests of essays, and to such comments on them as seemed requisite to explain their antecedents.

I make these remarks here because, during the period of some eight months to be covered by this chapter, there occurred scarcely anything of moment in the shape of incident. Only those who are interested in tracing the growth of theories will find in it matter to detain them.

"Method in Education" was commenced while I was at Earl Soham, but the inertness of brain consequent on bodily exertion in Switzerland had not been overcome, and little progress was made. Save the first few pages, the essay was written at Derby during November.

Its subject had a triple interest for me. Relating to it there were certain results of observation, and to some extent of experiment, which seemed worth setting forth, considered intrinsically. Then it had direct connexions with psychology, which was at that time dominant in my thoughts. Moreover, mental development had its place in the theory of development at large: serving at once to illustrate this and to be elucidated by it. If not consciously, still unconsciously, the desire to treat of it from the psychological and developmental points of view decided me to make "method in education" the topic for a review-article.

Under its biological aspect, education may be considered as a process of perfecting the structure of the organism, and making it fit for the business of life. Inferior creatures exemplify this truth to a small extent. The behaviour of adult birds to their newly-fledged offspring, and the play of a cat with her kitten, show us ways in which the young are induced so to exercise their limbs and perceptions and instincts as daily to strengthen them and give finish to the various parts called into action. In children the physical

education naturally effected by spontaneous play, as well as that artificially effected in a much less desirable way by gymnastics, visibly develops the muscles; and, as every physiologist will infer, develops also the nerves and ganglia which co-ordinate their movements, as well as the nerves and ganglia which are used in perception. A like development accompanies the activities classed as intellectual: there is a finishing of the employed cerebral plexuses. Nay, more than this is true. Every lesson learnt, every fact picked up, every observation made, implies some molecular re-arrangement in certain nervous centres. So that not only that effect of exercise by which the faculties are fitted for their functions in life, but also the acquirement of knowledge serving for guidance, is, from the biological point of view, an adjustment of structure to function.

What is the implication? Evidently that method in education must correspond with method in organization—must be a kind of objective counterpart to it. Organization does not go on at random, but everywhere conforms to recognizable principles; and unless these principles are recognized and conformed to in education, the organizing process must be impeded. It needs but to remember that in its rudimentary state every organism is simple, while it ends in being relatively complex, and often highly complex—it needs but to remember that in its first stage the forms and divisions of an unfolding germ are vague while in the adult they are quite distinct—it needs but to remember that these truths, holding of the transformation in its entirety, hold of it in all its details; to see that they yield guidance to the teacher in framing his system, and that if he disregards them he will commit grave errors; as when he insists on putting into undeveloped minds perfectly exact ideas: exactness being not only unappreciated by, but even repugnant to, minds in low stages.

I need not specify all the conclusions drawn from this general conception, which the essay set forth. I will add

only that from it were derived reasons "for making education a process of self-instruction, and by consequence a process of pleasurable instruction." And I name these two derivative principles only to gain the opportunity of saying that, in the enunciation and advocacy of them, I recognize, more than anywhere else, the direct influence of my father. It was by strengthening certain habits of thought that his chief influence over me had been exercised, and it thus was general only; but in this case it was special. If not by precept yet unmistakably by example, he produced in me an early acceptance of these principles; and there remained but to justify them by affiliating them on the Method of Nature.

That which is chiefly to be noted here, however, is the relation borne by the ideas in this essay to preceding and succeeding ideas. That its pervading doctrine was evolutionary goes without saying. But it yields proof that certain specific evolutionary doctrines were growing. It is said of mind that "like all things that develop, it progresses from the homogeneous to the heterogeneous"; and it is also said that "the development of the mind, as all other development, is an advance from the indefinite to the definite." Thus are shown the presence, and the incipient spreading, of conceptions which were afterwards to take a far wider range.

The title of this essay when published in *The North British Review* for May, 1854, was changed to "The Art of Education." It now forms the second chapter of *Education: Intellectual, Moral and Physical.*

Some reflections may fitly introduce the next essay. An American — or to speak strictly an Americanized Scotchman,—who maintained the unlimited right of the majority to rule, said to me that if the majority were to pass a law directing what food he should eat, he would obey. He was an enthusiastic upholder of free institutions,

or rather, of what he supposed to be free institutions. He would have been greatly astonished had I told him, as I might properly have done, that his conception of freedom was but rudimentary.

There has grown up quite naturally, and indeed almost inevitably, among civilized peoples, an identification of freedom with the political appliances established to maintain freedom. The two are confused together in thought; or, to express the fact more correctly, they have not yet been separated in thought. In most countries during past times, and in many countries at the present time, experience has associated in men's minds the unchecked power of a ruler with extreme coercion of the ruled. Contrariwise, in countries where the people have acquired some power, the restraints on the liberties of individuals have been relaxed; and with advance towards government by the majority, there has, on the average, been a progressing abolition of laws and removal of burdens which unduly interfered with such liberties. Hence, by contrast, popularly-governed nations have come to be regarded as free nations; and possession of political power by all is supposed to be the same thing as freedom. But the assumed identity of the two is a delusion—a delusion which, like many other delusions, results from confounding means with ends. Freedom in its absolute form is the absence of all external checks to whatever actions the will prompts; and freedom in its socially-restricted form is the absence of any other external checks than those arising from the presence of other men who have like claims to do what their wills prompt. The mutual checks hence resulting are the only checks which freedom, in the true sense of the word, permits. The sphere within which each may act without trespassing on the like spheres of others, cannot be intruded upon by any agency, private or public, without an equivalent loss of freedom; and it matters not whether the public agency is autocratic or democratic:

the intrusion is essentially the same. My American friend would, I suppose, have admitted that had he been a negro; and had a planter who bought him and set him to work, happened to have his plantation confiscated by the Government; and if the Government, carrying on the planter's business, made him, the negro, work under the lash as before; his slavery would be not much mitigated by the thought that instead of being coerced by an individual he was now coerced by the nation. Similarly, if he is forced to wear clothes of specified material or pattern, or if he is forbidden to take this or that kind of drink, the effect on him is the same whether the commands come from a despot or from a popular assembly. Had he a more developed conception of freedom, he would in all such matters of personal concern resent dictation by the million, as in past ages he would have resented dictation by the unit, and as he even now resents dictation by the million in respect of his religious beliefs and practices.

The power of the society over the individual is greatest among the lowest peoples. The private doings of each person are far more tyrannically regulated by the community among savages, than they are among civilized men; and one aspect of advancing civilization is the emancipation of the individual from the despotism of the aggregate of individuals. Though in an uncivilized tribe the control of each by all is not effected through formulated law, it is effected through established custom, often far more rigid. The young man cannot escape the tattooing, or the knocking out of teeth, or the circumcision, prescribed by usage and enforced by public opinion. When he marries, stringent regulations limit his choice to women of certain groups, or, as in many cases, he is not allowed to have a wife until he succeeds in stealing one. All through life he must conform to certain interdicts on social intercourse with connexions formed by marriage. So is it throughout. Inherited rules which the living

combine to maintain, and the authority of which no one dreams of questioning, control all actions. Similarly during the early stages of civilized societies, when the political and ecclesiastical institutions have become well organized, the despotism they exercise is associated with the despotism exercised by the whole community over every member through its irresistible usages. But on turning from the East, where this connexion has been in all times exemplified, to the West of modern times, we see that along with a decrease of political restraints and ecclesiastical restraints there goes a decrease of ceremonial restraints; so that now these dictates of the majority may, many of them, be broken with impunity or without serious penalty.

Doubtless the current conception of freedom is congruous with existing social life; and a higher conception would be dangerously incongruous with it. Primitive men, having natures in most respects unfitted for social co-operation, were held in the social state only by coercion of one or other kind: those varieties of them which would not submit, having failed to become social. Progress occurred where there existed such obedience to despotic rulers, political and ecclesiastical, as made possible the control of ill-governed and aggressive natures. At that stage the assertion of personal liberties, wherever it occurred, was a fatal impediment to national growth and organization. Only along with the gradual moulding of men to the social state, has it become possible without social disruption for those ideas and feelings which cause resistance to unlimited authority, to assert themselves and to restrict the authority. At present the need for the authority and for the sentiment which causes submission to it, continues to be great. While the most advanced nations vie with one another in committing political burglaries all over the world, it is manifest that their members are far too aggressive to permit much weakening of the restraining

agencies by which order is maintained among them. The unlimited right of the majority to rule, is probably as advanced a conception of freedom as can safely be entertained at present: if, indeed, even that can safely be entertained.

Ideas like some of these but less definite, or rather the sentiments appropriate to such ideas, prompted the article on "Manners and Fashion"; named at the close of the last chapter as having been agreed upon for publication in *The Westminster Review*, and which appeared in April. It was, I suppose, written at Derby before the middle of January.

As just implied, and as may be inferred from the latter part of the article, its original purpose was that of protesting against sundry of the social conventions to which most people submit uncomplainingly. Inherited nature and paternal example had united to produce in me repugnance of these, and especially to such of them as are expressive of class-subordination. But though, when planning the article, evolutionary views were not present to me, they came to the front when executing it. How things have come to be what they are—how they have naturally grown into their present forms, seems to have become a question which in every case presented itself; with the result that some fragment of the general theory of evolution was more or less definitely sketched out.

The truth that Law, Religion and Manners are related as severally being systems of restraints, having been illustrated, their bond of relationship was found in the fact that "originally Deity, Chief, and Master of the Ceremonies were identical." When, out of the primitive group, there arose some man whose remarkable powers, displayed chiefly in war, gave him predominance, the various kinds of control over the rest were simultaneously initiated. And out of this unity of control there was shown to arise that diversity of

control exercised by political, ecclesiastical and ceremonial institutions. Restricted to the development of one of these forms of control, the essay proceeded to show that in the genesis of Manners itself, may be traced this same divergence and re-divergence. As with obeisances, which are variously abridged and modified forms of the original prostration; so with titles, modes of address, and ceremonies of all kinds, the uniform has become the multiform.

Though between these conceptions and the developmental conceptions set forth in preceding essays, there is a manifest harmony, yet the phrases previously employed do not recur. The differentiation of the political, ecclesiastical, and ceremonial institutions, is said to be "in conformity with the law of evolution of all organized bodies, that general functions are gradually separated into the special functions constituting them"; but there is no reference to the implied transformation of the homogeneous into the heterogeneous. Similarly, while various of the facts given illustrate the transition from the indefinite to the definite, no mention is made of this trait of development. The substance of the conception had grown in advance of the form—had itself not yet become definite.

It should be added that there here makes its first appearance a doctrine which was, many years afterwards, elaborately developed—the doctrine that propitiation of the ruling man, becoming after his death propitiation of his double expected presently to return, gave origin to ideas and observances which became eventually those we class as religious.

What took me to London in the middle of January? Possibly in part my constitutional impatience of monotony; for life in Derby was always dull, and the change to London life with its exhilarations often served to raise my health up to par when it had been below par. Probably, however, the obtaining of additional information required

for articles in hand, and the making of engagements for further articles, were the predominant motives.

Letters written from my old haunt, 20, Clifton Road, St. John's Wood, contain passages which show what I was doing and intending to do. Here is an extract from one to my father, dated January 20.

"I am in negotiation with Chapman to write a short article on "Railway Morals" *à propos* of the guarantee system of extensions and preference shares.

"I am busy reading Comte, and am getting up a very formidable case against him. I have nearly finished a sketch of one article, which I have proposed to send to Fraser [then editor of *The North British Review*] but have not yet had a reply."

From another dated Jan. 28, I take the following:—

"As you will see by the last of the two enclosed notes from Cornewall Lewis, I am going to write the article on "Railway Morals" for the *Edinburgh Review*. I do not wish it known that I am going to do it for the *Edinburgh*; fearing that should the fact get to the ears of the adverse party, some countervailing influence may be used."

In a letter of 17 Feb. occur the paragraphs:—

"I have agreed to write for the *British Quarterly*. I took this step in consequence of finding (as you will see from the two enclosed notes from Fraser) that there is so much liability to delays that it is needful to have a good many strings to one's bow. Should Fraser not insert the Education article in the next number, it will put me somewhat about. However, now that I have arranged to write for the *Edinburgh* and the *British Quarterly* in addition, the inconvenience can be but temporary. It would be strange indeed if, when contributing to four Quarterlies, I should not have demand for five articles in the year; seeing that hitherto I have written two a year for the *Westminster* alone. . . .

"I do not involve myself in the re-publication of "Over-Legislation." It will be wholly an affair between Chapman and Mr. Morley. I have been making important additions. Chapman could not afford space for the "Railway Morals" in the next number of the *Westminster*. Hence I thought best to try the *Edinburgh*, and although its publication will be delayed there, it is a much more influential medium.

"I have just proposed the review of Comte to Dr. Vaughan [then Editor of *The British Quarterly Review*] but fear that I am too late.

My chief vexation just now is that I have sketches of two important articles on this topic and doubt whether I shall get a place for either."

Here are passages from a letter written to my mother on 27 Feb.

"I enclose two notes from Dr. Vaughan, for whom I have agreed to write one of the reviews of Comte. . I feel somewhat inclined, if it will be con-

venient, to come down to Derby in April and stay with you into midsummer, on the usual terms [*i.e.* contributing my share to the household expenses, which I made a *sine quâ non*]. I propose this partly because I wish to save up a considerable sum for my projected stay in Paris in the autumn, and partly from the wish to put myself under regimen in the way of exercise in boating, &c."

"I have commenced to day the paper for the *Edinburgh* on Railway Morals. It will be a terrific exposure."

I wrote to my father on March 14:

"I am getting very anxious to begin the *Psychology*, which is constantly growing. . . As soon as I have completed the two articles I have in hand, I shall devote myself *wholly to it.*"

It seems that I returned to Derby a few days after the last-named letter was written, and there remained until towards the end of June.

Instead of the words "I am busy reading Comte," used in one of the foregoing extracts, the words used should have been—I am busy reading Miss Martineau's abridged translation of Comte. This had then been recently issued; and as two of my friends, Mr. Lewes and Miss Evans, were in large measure adherents of Comte's views, I was curious to learn more definitely what these were. Already, as said in a preceding chapter, I had got through the "Exposition" in the original; and while remaining neutral respecting the doctrine of the three stages, had forthwith rejected the classification of the sciences. I had also read Mr. Lewes's outlines of the Comtean system, serially published in *The Leader*. Whether, when I began to read Miss Martineau's abridged translation, I had any intention of reviewing it, I cannot remember; but evidently, if not present at the outset, the intention was soon formed.

The disciples of M. Comte think that I am much indebted to him; and so I am, but in a way widely unlike that which they mean. Save in the adoption of his word "altruism," which I have defended, and in the adoption of his word "sociology," because there was no other available

word (for both which adoptions I have been blamed), the only indebtedness I recognize is the indebtedness of antagonism. My pronounced opposition to his views led me to develop some of my own views. What to think, is a question in part answered when it has been decided what *not* to think. Shutting out any large group of conclusions from the field of speculation, narrows the field; and by so doing brings one nearer to the conclusions which should be drawn. In this way the Positive Philosophy (or rather the earlier part of it, for I did not read the biological or sociological divisions, and I think not the chemical) proved of service to me. It is probable that but for my dissent from Comte's classification of the sciences, my attention would never have been drawn to the subject. Had not the subject been entertained, I should not have entered upon that inquiry which ended in writing "The Genesis of Science." And in the absence of ideas reached when I was tracing the genesis of science, one large division of the *Principles of Psychology* would possibly have lacked its organizing principle, or, indeed, would possibly not have been written at all. In this way, then, I trace an important influence on my thoughts exercised by the thoughts of M. Comte; but it was an influence opposite in nature to that which the Comtists suppose.

I need not here say anything about my strictures on the schemes of Oken and Hegel, each of whom preceded Comte in the attempt to organize a system of philosophy out of the sciences arranged in serial order; nor need I say anything about the proofs given that Comte's classification of the sciences is neither logically nor historically justifiable; nor about the assigned reasons for holding that the relations of the sciences cannot be expressed by any serial arrangement whatever. This critical part of the article, though originally intended to be the chief part, eventually became merely preliminary to the constructive part; which

alone calls for comment in this place as being connected with subsequent developments of thought.

First pointing out how erroneous is the common notion that the knowledge called science is somehow sharply distinguished from common knowledge; and then tacitly affirming the self-evident truth that science must have gradually emerged from common knowledge; the essay proceeds to set forth the process of emergence. Even crude knowledge of things around exhibits prevision of one kind or other. Scientific prevision, acquiring definiteness as the knowledge of *a* relation between phenomena grows into knowledge of *the* relation, acquires still greater definiteness as *qualitative* prevision grows into *quantitative* prevision—as the ability to predict the kind of foreseen result grows into the ability to predict both the kind and the amount. This advance implies the conception of *measure*. Ideas of *like* and *unlike*, underlying the discriminations which even animals make, are suggested to the primitive man by various things, and especially by organic bodies: like shapes, colours, weights, are shown him by fish from a shoal, birds from a flock, beasts from a herd. Occasionally the objects are so nearly alike as to be scarcely distinguishable; and there emerges the idea of absolute likeness or *equality*. Of equalities, the most exactly ascertainable are those of lengths. Two fishes side by side, showing equality of length, simultaneously imply the ideas of *duality* and of *measurement* by apposition. Such experiences, while thus yielding the ideas of equal lengths and equal units of length, which are the root-ideas of geometry, also yield the idea of equal units in the abstract, which is the root-idea of number and of the calculus in general. At the same time, since these organic bodies habitually present like relations among their attributes—size, form, colour, odour, taste, motions—in such wise that two or more of them being given others can be inferred, a concomitant consciousness of *likeness of relations* results;

whence arises ordinary reasoning. Eventually out of this comes the conception of *equality of relations*, on which scientific reasoning proceeds. Those subsequent steps in the genesis of science thus initiated which are presented by the several sciences as they arise and diverge, cannot here be named. It must suffice to say that along with the process of divergence and re-divergence sketched out, there is sketched out the increasing inter-dependence of the sciences. It is curious, however, that though there are clearly portrayed in the article the increasing heterogeneity in the general body of the sciences, the increasing definiteness shewn by all its components, and the increasing integration implied by their mutual influence and aid, there is no specific reference to this advance from the homogeneous to the heterogeneous and from the indefinite to the definite; though these formulæ had been used in a preceding essay. Again the substance of the conception had grown faster than the shape, which had not yet acquired definiteness.

During the spring and early summer there continued those signs of cardiac enfeeblement which set in after my return from Switzerland. They had diminished, indeed, but were still perceptible enough. Towards the end of June I decided to try hydropathy: not, I believe, because I had much faith in the nominal remedy; for it seemed to me then, as now, that the actual remedy is the change from an unhealthy, indoor, hard-worked and often anxious life, to a life of ease, novelty, and amusement, spent largely in the open air, while keeping regular and early hours and eating wholesome food. But whether the causes of improvement to health were essential to the system or concomitant only, it seemed worth while to give them a trial. I went to the establishment in which my uncle had, more than once, derived much benefit. An account of my experiences there is contained in the following paragraphs from a

letter to my mother, dated Umberslade Hall, Hockley Heath, Birmingham, 30 June, 1854.

"I would have written earlier but that I waited until I had something definite to report; and I should certainly have written yesterday had not Dr. Johnson taken me out for a drive in his gig, and remained out till after post time.

"I have nothing very definite to tell you, further than that on the whole the palpitations seem to be gradually diminishing and do not generally attract my attention even at night; although still more or less perceptible then, when I purposely direct my attention to them. In other respects I am much as I was. No great effect either one way or other seems to be produced by the treatment, so far as I can judge by my feelings. But being on the whole very well, I don't know that I have any right to expect any very marked results.

"There are about 24 patients here at present. They are on the whole not a particularly interesting class of persons. My chief companion is Dr. Johnson himself, with whom I have a good deal of talk from time to time. The time however passes pleasantly enough. The Hall stands in the midst of extensive grounds, with plantations and drives, two lakes with boats on them, and plenty of country lanes in the surrounding districts; so that by the aid of walks and games and boating and driving, with the frequently recurring baths, the days slip quietly by."

There had then but just commenced that transformation which hydropathic establishments have undergone. It has been amusing to watch the process by which classes of English people with ascetic or semi-ascetic ideas, have been betrayed into a mode of enjoyment which they would have looked askance at had it been proposed to them without disguise. If, forty years ago, anyone had advertised a country house in which the guests, living as a family, were to be provided with facilities for passing the time pleasantly, he would have had small chance of success. But the average Englishman has great belief in the benefits of any regime which treats his body severely, and makes him do things that are not agreeable to his sensations. The water-cure consequently fell in with his humour; and he took to it kindly. For companionship, patients brought with them relatives, often much younger, who needed no treatment. Those who took baths presently came to be out-numbered by those who merely utilized the opportu-

nities for amusement; until at length, the hydropathic element becoming comparatively unobtrusive, there have grown up all over the kingdom places in which people assemble to have games and drives and picnics and balls, to flirt and to make matches.

Leaving Umberslade for London before the middle of July, I there occupied myself in bringing to a close some literary engagements. Though, as implied above, the article on "Railway Morals and Railway Policy" had been commenced early in the spring and had been completed at Derby, it was requisite, considering the seriousness of the allegations it made, to submit it, when in proof, to sundry of those who were familiar with the doings of the railway world. After these allegations had received their indorsement there came the need for dissipating the qualms of the editor of *The Edinburgh Review*—at that time Sir George Cornewall Lewis. I have pleasant recollections of my interview with him, and retain a clear picture of his remarkable face, though I never saw it again.

In a letter to my father dated 5 September 1853, occurs the passage:—"If you will get hold of Tuesday's *Times* you will see a report of a meeting of South-Western Railway shareholders in which I took part—moved a resolution and made a speech." It was from the impression made on me by the doings of the Board at this meeting, that the article in question originated. The experiences of my earlier engineering days had not revealed to me much; partly because I was not behind the scenes and partly because at that time corrupting influences were but beginning. During the railway-mania, however, when I resumed engineering, the motives and actions of those concerned became partially known to me. The conspiring together of lawyers, engineers, and others seeking for professional work, with promoters greedy of premiums, all

utterly regardless of those who were betrayed by their hollow schemes, repelled me so effectually that I never applied for a single share, though I might have had many. Having at that time seen something of railway morals from the inside, I now, as proprietor, saw something of them from the outside: knowledge of motives gained in the first case serving to interpret actions in the second. I was indignant at the way in which proprietors were deluded by schemes projected and executed for the benefit of those who governed and those in league with them; and determined to expose the state of things.

As the developmental course of thought which it has been my purpose to trace in preceding brief analyses of articles, is not illustrated by this article, I need not here say anything about its contents further than to note the sole philosophical, or in this case ethical, principle enunciated. This principle was the undeniable one, that by a contract no person can be committed to more than he contracts to do. It was argued that this applies to the proprietary contract as to all other contracts; and that therefore the railway-shareholder cannot in equity be committed by any act, either of a board of directors or of his brother shareholders, to schemes not named in the deed of incorporation. And it was contended that the wide-spread ruin of individuals, and immense loss of capital by the nation in making unremunerative lines, would never have occurred had not the proprietary contract for making a specified railway, been habitually interpreted as though it were also a contract for making unspecified railways.

Concerning, as it did, the interests of multitudinous people, and containing many startling statements, this article attracted much attention—much more attention than anything else I ever wrote. It was eventually, with my assent, republished by Messrs. Longman in their "Traveller's

Library." Some of the contained revelations brought upon them the threat of an action for libel.

My detention in London during the greater part of July was not without its compensations. Among these were several visits to the Crystal Palace, then recently opened, and then having a beauty which those who have seen it only of late years can hardly imagine. A letter to my friend Lott, expressing the wish that he would join me in visits to it, says:—"but I suppose that nothing can neutralize your yearning for the hills (joined with that of your wife) for this summer at least." Succeeding paragraphs in the letter I give, because of the sundry things which they indicate.

"I mean to get away from town as soon as I can—perhaps in little more than a fortnight. Not feeling that Umberslade has been beneficial, I am desirous of getting away to the sea-side as soon as may be; holding, as I do, that it is the best policy to take prompt measures to get rid of even minor bodily evils, lest they should entail greater ones, as they always tend to do.

"Will the dividends on the American shares be forthcoming before I go? My reason for inquiring is not that I am likely to have any need of them for some months to come, but that there would, I suppose, be some inconvenience in sending the amount to me whilst at Paris.

"I quite sympathize in your wish for the renewal of our pleasant excursions, than which there are few things I have enjoyed more. Next time I hope that Mary Roe [his sister-in-law] will be one of our party. I have great faith in the laughter cure; and her nonsense makes a good ingredient in it. Tell your wife that she should be ashamed of herself to be unwell at Quorn; and that unless she forthwith reports herself well, I shall accuse her of plotting to get to the lakes."

Above, I have spoken of the attractiveness of the Crystal Palace in its early days. Here from a letter to my mother dated 15 July, let me quote a passage referring to it.

"I have been once at Sydenham. It surpasses even my expectations though I had seen it in progress. It is a fairy land; and a wonder surpassing all others."

The degradation which it has since undergone, illustrates the way in which too strenuous an effort to make a thing good may end in making it bad. Had there not been

so vast an expenditure on the great terraces, the immense flights of steps, the basins, fountains, and water-towers, the dividend on the capital invested in the Palace and its contents, would probably have been sufficient to satisfy shareholders; and there would not have been those frantic efforts to increase returns, which have ended in making the place a compound of bazaar, theatre, fancy fair, refreshment room, and tea-garden.

My matters of business having been transacted, I was now free to commence my long contemplated work on Psychology. Foregoing extracts from letters contain two indications that during the spring there had arisen the question — Why remain in England while writing the book? Why not write *it* abroad? Easy access to other books was not requisite; for its lines of thought had scarcely anything in common with lines of thought previously pursued; and of such material as was needed for illustration, my memory contained a sufficient stock. Why not then go to France, spend the remainder of the summer on the coast, and winter in Paris? Arrangements in pursuance of this scheme had been gradually made.

At the close of Chapter XXIII, my experience of a remarkable coincidence of names was noted, but a still more remarkable coincidence had now to be described. It occurred just before I departed for France. While in London in the spring, I had been attended during indisposition by Mr. Robert Dunn, a medical man then residing in Norfolk Street, Strand. The small claim he had against me I wished to settle before leaving. What happened is told in the following extract from a letter to my father, dated 28 July.

"I met with a most extraordinary coincidence since you left. Calling on Mr. Dunn, the surgeon, I was told by the young man in his surgery that he was out. I said I would leave a card for him. I took one out and gave it to this assistant. I noticed that when he read the name he raised his eyebrows and gave a start. Judge my astonishment on finding that his surprise arose

from the fact that *his name too was Herbert Spencer.* I would almost have taken an oath that there was no other person with the same name. That there should not only be one, but that I should meet with him and hand my card to him, is one of those strange events which we should call absurd in a romance."

At that time its strangeness seemed much greater than it seems now; for in the days when my double and I were baptized, the name Herbert, though now not uncommon, was extremely rare. Up to the age of 30 I never met any one bearing it.

The incident had a sequel. On my return from France some time afterwards, I again called to pay Mr. Dunn's account, and again Mr. Dunn was from home. Not wishing to have any further trouble, I said I would pay to this namesake of mine the amount due. The result of course was that I obtained a bill made out to Herbert Spencer and receipted by Herbert Spencer. I still have it among my papers.

Some years afterwards this second Mr. Herbert Spencer was house surgeon to the London Hospital. Eventually he settled at Bradford, in Yorkshire, where he still resided in 1886.

Afterwards there appeared on the scene a Dr. Herbert Spencer, who now practices in London. From 1888 to 1899 the two names occurred together in *The Medical Register.*

Later came still another Herbert Spencer—a pickpocket! (See daily papers for July 6th, 1893.) Two others have since come to my knowledge—one a Birmingham manufacturer (now dead) and the other a secretary to Mr. and Mrs. Sidney Webb.

CHAPTER XXXI.

MY SECOND BOOK.

1854—55. Æt. 34—35.

Lying about eight miles north-east of Dieppe, Tréport is a small sea-port at the mouth of a valley which there makes a gap in the fine chalk cliffs extending along the coast each way. Some three miles, perhaps, up the valley, lies Ville d'Eu, containing, among other things, a château which belonged to Louis Philippe, who had also built himself a pavilion on the shore at Tréport. This Royal patronage it was which, I suppose, had brought Tréport into fashion as a sea-side resort—fashion which had not, however, in 1854 risen high enough to spoil it. My father had spent his midsummer vacation there; and his account of the place led me to choose it as my place of sojourn for the rest of the summer.

As the sea-side is found to be salubrious, the common inference is that the nearer the water the more beneficial the effect. This is a great mistake. The air of a beach, especially during warm weather and when the tide is out, is highly charged with vapour, and to many constitutions therefore enervating: differing widely in this respect from the air fifty or a hundred feet higher. My attention was first drawn to this contrast by my experiences at Tréport, where, on this first occasion, I settled myself in the Grande Rue, some distance back from the shore and high above it.

The house had a garden running up the slope towards the western cliffs, and at the top of this garden was a

summer-house which made an agreeable writing-room for me in fine weather. Here I commenced *The Principles of Psychology*. A letter to my father dated 7 August contains the paragraphs:—

"I like the place very well. During some bad weather which lasted over Friday and Saturday, I felt rather disgusted and inclined to go away as soon as I could; but now that the weather is fine again, I feel inclined to stay out the month, as I had intended. The change of feeling is partly due also to the fact that I have, during the last two days, after the usual initial struggle, got into writing cue, and am fairly started with the Psychology. Finding it at first rather repugnant and being dissatisfied with what I did, I felt disgusted with things in general; but now that the inertia is overcome and I am quite satisfied with my work, things seem pleasant enough . . . .

"I admire the coast and the cliffs very much; and find plenty to examine on the shore at ebb tide—many things that are new to me. On Sunday I saw *a large piece of cliff fall*—a slice extending from top to bottom. It was just beyond the end of the parade to the west of the town. I was on the sands just facing it when it fell, and saw the whole process. No harm was done. . . .

"I have not explored the country much at present; save going as far as Eu, where I walked on Sunday. I find that that is the Château d'Eu which stands close behind the Church.

"It is half past three and I must start off for my walk."

A tall, finely-built man, obviously English, had several times passed me in the town or on the cliffs, and we had looked askance at one another. At the public room or *salon* on the beach, I one day handed him a newspaper. This led to friendly interchange of remarks, and in a week or so we took our afternoon walks together. It was Mr. George Rolleston, in later years Professor Rolleston of Oxford. Our intercourse enlivened my stay; for besides being a man of wide culture he had a pleasant facetiousness which gave zest to his talk. Probably but for the acquaintanceship thus commenced, I should not have remained at Tréport as long as I did.

Even as it was my impatience of monotony caused me to leave it while the weather was still hot, and, as it turned out, much earlier than I ought to have done.

Curiosity was doubtless a spur to this premature de-

parture. I was now 34 and had never seen Paris. Naturally the anticipated pleasure hastened my movements. A letter home speaking of my migration, dated Paris 14 Rue de l'Université, 31 August, 1854 says—

"I left Tréport on Tuesday; on which day my month expired, and arrived at Paris in the evening. The last two days have been spent in seeking lodgings, and I have only this morning fixed myself. I am on the south side of the river and about ten minutes' walk from the Louvre and the Tuileries. . . .

"I am certainly astonished at the beauty of Paris, though I have as yet seen only part of it. The Boulevards at night are especially astonishing. The whole aspect of things gives one the idea of a perpetual gala. Nevertheless I cannot but regard the enormous contrast between Paris and the provinces, in respect of advancement, as indicative of essential unhealthiness. The state of the peasantry in my walks about the country seemed to me very miserable—scarcely anything but cottages built of wattling and mud, and scarcely enough spirits in their inhabitants to render them curious as to the passers by. Paris has grown to what it has at the expense of France. . . .

"I very much question whether I shall remain here as long as I intended, or anything like it. My letters of introduction are useless at present, as people are away from Paris. I expect I shall feel rather lonely."

This was the first of many instances showing that I cannot bear to be cut off from my roots, and that I have not patience enough to wait until I root myself afresh. I soon get weary of sight-seeing, and cannot play the *flaneur* with any satisfaction. Moreover, in this case, the difficulty of carrying on conversation soon made wearisome what little social intercourse was available. When, with the effort to find words, there is joined the consciousness that multitudinous blunders are being made, there naturally results a tendency to abridge interviews, even when they are interesting, which most interviews are not. Hence the resolution notified in a letter to my father dated 12 September, after only a fortnight's stay.

"I think of leaving Paris at the end of this week and going to Jersey. Almost every one is away at present, and though I meet with great hospitality where it is possible, I feel the want of society very much. It would be a month or more before this would be remedied. Moreover I am not getting on with my work so well as I wish. The quality is satisfactory but not the quantity. And further, Paris is still very hot and is somewhat detrimental to me. I shall therefore, I think, postpone my sojourn here till next year

somewhat later in the season; and in the meantime go and set myself down at St. Heliers, where I doubt not I shall get on well with my *Psychology*, benefit in health, and probably get a sufficiency of pleasant society. Will you in the course of the week write me a letter, *poste-restante*, St. Heliers, giving me any information you can about hotels; so that I may know on my arrival where to go. I got your letter this morning, and was glad to do so, having not heard for so long. . . .

"I spent an evening with the Bradleys [some Derby friends whom I accidentally met] and I join them this afternoon for a walk in the Bois de Boulogne. I have, by means of letters of introduction, made the acquaintance of the Editor of the *Revue Contemporaine*, the Editor of the *Revue Britannique*, the Editor of the *Revue général de l'Architecture*, and one of the writers of the *Revue des deux Mondes*. The third, who was just leaving for Germany, pressed me to go and make use of his country house during his absence. I dine with his family to-morrow.

"I was at the fête of St. Cloud on Sunday; and was much amused by the juvenility of the adults. The French never entirely cease to be boys. I saw grey haired people riding on whirligigs such as we have at our own fairs."

To the list of those I made acquaintance with, should have been added M. Littré, to whom Lewes had given me a letter of introduction. What passed between us I cannot now say. I remember only that he was a mild-mannered man, who had the traits of a student and a recluse. Judging from his appearance, I should have thought he had not stamina enough for his amazing achievement.

The resolution above indicated was carried out; and the next sign of my whereabouts is a letter dated Bree's Boarding House, Jersey, 26 September. After giving some account of a twenty-seven hours' journey, chiefly by diligence, which had proved somewhat injurious, the letter continues:—

"St. Malo is a very remarkable and very picturesque old town, strongly fortified, and bearing all the aspect of old times about it. I felt half inclined to stay awhile, but found at the end of two days that it would be very dull, somewhat expensive, and I think not very salubrious.

"I am delighted with the island and more particularly with the coast. The formation is volcanic and there is a ruggedness of outline and structure, and a variety, that I have never seen before. Add to which that from the hardness of the rock, the water disintegrates it but little and remains quite clear,

which I have never before seen it do. The coast to the S.W. (Portelet Bay and St. Brelades Bay) has delighted me more than any coast I ever saw.

"The weather is very pleasant in fineness and temperature and I have benefited considerably. There is not much society here, however, as the season is coming to an end; and what there is I do not find very interesting. I am thinking of leaving next week for Brighton, where I have some friends, where I may stay awhile on my way back to town. I am the more induced to do this because, though I am getting on tolerably with the *Psychology*, the hours here do not suit my writing well, and I see that it is needful for me to be in lodgings to make the best of the day; and here lodgings would be insufferably dull now that the place is emptying.

"If the weather is fine I think of leaving on Monday next; but should the equinoctial gales set in, and last till after that time, I may probably stay here somewhat longer, so as to get a quiet passage."

Of course, as for leaving Paris long before I had intended, so for soon leaving Jersey, there were assignable reasons: there always are reasons for doing that which one's feelings prompt. In either case, the discontented mood consequent on being far from friends, was, I suspect, the chief cause. I can do pretty well without seeing friends for some time, if I am within hail of them; but the consciousness that they are inaccessible is soon followed by depression.

The intention of migrating to Brighton took effect at the time named. In a letter thence, dated 2 Clifton Terrace, 2 October, occurs the following paragraph:—

"The place is very full. Yesterday I met four persons I knew. One was Louis Blanc, with whom I had a long walk and argument. The day before I caught sight of Thackeray talking to some one. Possibly I may see something of him while here. I think I shall get on well with my writing, and hope to benefit in all respects."

Answering a question from my father respecting the discussion with Louis Blanc, a subsequent letter says—

"My argument with Louis Blanc had nothing to do with Socialism, but with centralization. He admits its injurious effects in France; but thinks that the fault lies in its application in wrong directions."

As the little man—something under five feet I suppose—was animated, and my own mode of expression not wanting in energy, we drew inquiring glances as we walked up and down the parade. He spoke English remarkably well:

having a good choice of words which he put together correctly and articulated with great distinctness—greater distinctness, indeed, than is usual among ourselves. Moreover, he had acquired the English cadence much more nearly than foreigners generally do.

I am reminded of a story which he told concerning a dreadful typographical blunder. The story has not, I think, become generally known; and as it is too good to be lost, I repeat it here. At that time, or not long before, lived a French lady-novelist who wrote as "La Comtesse ——." The blunder occurred in the closing sentence of one of her stories: a sentence which was intended to embody its moral. As it left her pen the sentence ran—"*Bien connaître l'amour il faut sortir de soi.*" Instead of this the printers made it—"*Bien connaître l'amour il faut sortir le soir.*"

Correspondence shows that I was in town before the end of October. Giving the address 4 St. Ann's Terrace, Acacia Road, I wrote home—

"I inclose a note which I have received since returning to town, relative to a reprint from "Social Statics." I shall probably consent * * *

"I am tolerably well, though not rid of the palpitations, which I suppose will now always continue more or less. However, as there is no organic mischief and they give me no annoyance worth mentioning, I suppose I must not complain."

In a letter dated 2 November, occurs the paragraph:—

"I am just finishing one of the four divisions of the *Psychology*—the "General Synthesis." This, with the Universal Postulate, which with a few additions forms the first part or "General Analysis," finishes two parts. I am now about to commence the "Special Analysis." "

As thus shown, the four parts were not written in the order they followed when printed. Part III was written first: the reason being, I believe, that it contained the fundamental conception which pervades the entire work; and I was anxious to put this conception down on paper in its complete form. This having been done, I reverted to the arrangement of the parts as they were intended

to stand; and wrote the remaining ones in the order I, II, IV.

On December 3, I wrote responding to my father's expressed wish that I should go down to Derby for a time. One reason for assenting was want of society.

"I find it rather dull here at present. There are but few people in town; and of those who were here when I came, some are now gone."

Passing to other matters the letter continues :—

"The Psychology is going on very well, though not altogether so fast as I could wish. The theory of reasoning is working out beautifully. . . .

"You would no doubt regret to hear of the death of Professor Forbes. I am very sorry indeed. He was not only a valuable man of science, but also extremely likable as a man; and I had hoped to cultivate the friendship that had commenced between us. Few men seem to have been more universally regretted."

In pursuance of the intention indicated in this letter, I presently went home, and, spending Christmas there, remained through part of January. No clue to any occurrences is given by correspondence, save by a letter from my mother to my father, who was away on a Christmas visit. It appears from this that I was unwell, and sometimes got no sleep till five o'clock in the morning: a sign, I suppose, that thinking and writing were beginning to tell upon me.

Towards the end of January I returned to town. It seems that my chief purposes in doing so were to arrange with the printer, and, if possible, to find some publisher who would take the whole or part of the risk of my forthcoming book. While referring to these objects, a letter which I have headed simply Monday, but to which my father has fortunately added the date, 29 Jan. 1855, also contains a passage of importance.

"I got the inclosed this morning relative to the review of Comte for the *Edinburgh*. It is, you will see, favourable as far as it goes.

"Mr. Woodfall is about to send me an introduction to Walton and Maberly, the publishers, whom he recommends. So I shall probably be in negotiation with them in the course of this week.

"Chapman was wanting me to write an article when I saw him the other

day, on the Maine Law and the Sunday Beer-Bill. He asked whether I ever meant to do any more review-writing: evidently being anxious to get something from me. I declined the article he mentioned, but told [him] I would write him one on *The Cause of All Progress*, as soon as I was at liberty. If Walton & Co. do not bid for an edition of the *Psychology*, I may do this article forthwith."

This last paragraph gives a date to the inception of the general doctrine of evolution; or rather, it shows that this inception was not later than January, 1855. For the article named in it was the one eventually published under the title—"Progress: its Law and Cause." Doubtless it was during the preceding autumn that the change from homogeneity to heterogeneity, which we have already seen was in course of being recognized as characterizing the change from lower to higher in several diverse groups of phenomena, was recognized as characterizing this change in all groups of phenomena. And doubtless this development of the conception took place while writing the "General Synthesis;" two chapters of which trace, among mental phenomena, the progress from the homogeneous to the heterogeneous, and two other chapters of which exhibit the progress in speciality and in complexity: both involving the same trait.

The next letter to my father, which is dated "Feb. (what day I can't say) 55," in its first paragraph implies an inclosed letter from Sir G. C. Lewis. The proposed article on Comte, to which this referred, was obviously the second of the two named in the last chapter as having been originally planned

"You see that the paper for *The Edinburgh* is negatived by a pre-engagement. As he invites me, I think I shall propose one on Transcendental Physiology; but not for immediate execution.

"I dined at the Coopers on Friday last in company with Professor Owen and his wife, and went with them afterwards to hear him give a lecture at the Royal Institution, on the relation between Man and the anthropoid apes. It was the same thing that I had heard before in his lectures [at the College of Surgeons], and anything but logical. . . .

"I have had some negotiations with publishers. Walton and Maberly were prevented from going into the matter by religious difficulties. I am now in negotiation with Smith and Elder. I like very much what I have

seen of them, and think it not unlikely from their mode of treating the matter that they will make an offer. They have got Parts I & III now in their hands to form an opinion of the book."

After some weeks, during which my hopes had been somewhat raised by Messrs. Smith & Elder's intimation that they took a "favourable" view, I received their proposals. These, to my surprise, practically left me to bear all the risks, with but a remote chance of benefit should the book succeed. In my letter closing the negotiation, I remember saying that if such were their "favourable" terms, I was curious to know what their unfavourable terms might be.

But it was absurd to expect that a publisher could be found who would speculate in a work of so unpopular a kind. Very few grave books pay; most of them fail to return their expenses; and one on so uninviting a subject as psychology, by an author not bearing any endorsement, was sure to entail a loss. I ought to have known at the outset that, as before, so again, I should have to publish at my own risk; or, to speak definitely, should have to pay a penalty for publishing.

The need for economy now became increasingly manifest. I had done no remunerative writing since the preceding midsummer; and the non-receipt of an anticipated dividend on certain American railway-shares which I held, reduced my resources below the amount I had counted upon. It was thus clear that unless I took precautions, my purse would be empty before my book was finished. Leaving a quantity of MS. with the printer, I therefore, in the middle of March, returned to Derby; where I could live at much less cost than I could live in London.

An uneventful three months now followed. Concerning my life at Derby until the close of June, there is scarcely anything to say. The daily routine, and the signs of coming bad health, are the sole things I remember.

I spent something like five hours a day in writing:

beginning between nine and ten, continuing till one, pausing for a few minutes to take some slight refreshment, usually a little fruit, and resuming till three; then sallying out for a country walk and returning in time for dinner between five and six. I had often warned my friends against overwork, and had never knowingly transgressed. Five hours per day did not seem too much; and had there been no further taxing of brain, no mischief might have been done. But I overlooked the fact that during these months at Derby, as during all the months since the preceding August, leisure hours had been chiefly occupied in thinking. Especially while walking I was thinking. The quickened circulation consequent on moderate exercise, produced in me then, as always, a flow of ideas often difficult, if not impossible, to stop. Moreover the printers were at my heels, and proofs coming every few days had to be corrected: tasks which must have occupied considerable portions of my evenings. Practically, therefore, the mental strain went on with but little intermission.

That mischief was being done ought to have been clear to me. A broad hint that I was going wrong was this:—One of Thackeray's stories—*The Newcomes* I think it must have been—was in course of issue in a serial form. When a new part came out I obtained it from a local library, and, reserving it till the evening, then read it through. As often as I did this I got no sleep all night, or, at any rate, no sleep till towards morning. My appearance, too, should have made me pause. A photograph still existing, which was taken during the spring, has a worn anxious look; showing that waste was in excess of repair. It seems strange that such knowledge as I had of physiology, did not force on me the inference that I was injuring myself, and that I should inevitably suffer.

But giving no heed to these warnings I thoughtlessly went on without cessation; eager to get the book done, and, I suppose, hoping that rest would soon re-establish

my ordinary health. Towards the end of June there remained but three chapters to write. These were written elsewhere.

An artist, and head of the School of Art in Derby, Mr. A. O. Deacon, was about to spend his midsummer vacation in North Wales. I had been on friendly terms with him for some years; and our plans were in partial agreement. Travelling together as far as Conway, we there parted—he for Llandudno with his two boys and I for Bettws-y-coed—after having arranged to meet subsequently.

I had fixed upon Bettws as a place where I should get some fishing to occupy leisure times; but, as experience soon proved, the expectation was an ill-grounded one. Experience soon proved, moreover, that my vain hope had taken me to an undesirable place; for Bettws, being at the bottom of a close valley, is very enervating. A further sign of the coming disaster commenced here and continued afterwards; namely lying awake for an hour or two in the middle of each night.

A migration at the end of a week took me to Capel Curig, or rather to a hamlet half a mile to the East of it, Bryntich, where was a small hotel frequented by artists who had not yet won their spurs. Two were staying there. One of them at that time unknown but now well known, was Mr. Alfred Hunt. As I was interested in art, and apt to give utterance to my heresies, there resulted a good deal of lively talk between us, which usefully diverted a little the current of my thoughts.

The weather being fine, my writing while in Wales was done almost wholly out of doors. Furnished with a pocket inkstand I daily started off, manuscript in hand, for a ramble among the hills or along the banks of the Llugwy; and, from time to time finding a convenient place, lay down and wrote a paragraph or two. The opening of the chapter on "The Feelings" was written while reclining on

the shore of Llyn Cwlya, a secluded lake some two or three miles from Bryntich. A week or so previously, while at Bettws, this practice had led to an amusing incident. After lying for some time with eyes fixed on the paper, I raised my head and saw, a few feet off in front, a semi-circle of sheep intently gazing at me: doubtless puzzled by a behaviour unparalleled in their experience. I was at the time busy with the chapter on "Reason," and had I thought of it might have used the incident as an illustration. For it is a truth made manifest not only by comparing lower animals with men, but also by comparing different grades of men with one another, that whereas inferior intelligences go on making multitudinous observations to little purpose (drawing either no conclusions or wrong conclusions), superior intelligences, from a few observations properly put together, quickly draw right conclusions.

After some ten days at Bryntich, I removed to a place a few miles higher up the valley, where Deacon and I had agreed to meet.

This place was Pen-y-Gwyrid—a place of sad memories to me; for it was here that my nervous system finally gave way. Deacon failed to keep his appointment: writing me a letter from Nant Mill saying that he had commenced a picture there, and could not leave. The result was that, in the absence of all other guests at the hotel, I was alone; and thinking went on during meals and in the evening, as well as while I was at work and while I was walking. Some days seem to have passed without manifest mischief, as witness the following passages from a letter to my mother, dated 16 July:—

"I send you a line to say that I am well, and enjoying myself as much as hard work will let me. I am at present staying just under the foot of Snowdon. . . . It is a far finer mountain than I expected. The weather to-day is wet and dreary; but on the whole it has been very favourable. . . .

"I leave this on Wednesday next for Beddgelert, where I shall probably

stay a week and from whence I shall probably ascend Snowdon in company with Deacon."

But before this removal the mischief was done. One morning soon after beginning work, there commenced a sensation in my head—not pain, nor heat, nor fulness, nor tension, but simply a sensation, bearable enough but abnormal. The seriousness of the symptom was at once manifest to me. I put away my manuscript and sallied out, fishing-rod in hand, to a mountain tarn in the hills behind the hotel, in pursuance of a resolve to give myself a week's rest; thinking that would suffice.

Next day came a walk to Beddgelert. That place being much shut in, proved, as I might have known it would, very enervating. After two days I left for Carnarvon and afterwards for Bangor; taking up my abode at Garth Point for a week. While there I managed to finish everything but the chapter on "The Will," with which the work ends.

The close of the month found me back at home; where this last chapter was completed under great difficulties. I alternated between house and garden: writing a few sentences and then pacing up and down for a time to dissipate head-sensations—a persistence in physiological wrong-doing which brought on further serious symptoms.

Meanwhile the printers had overtaken me. There remained only to see the last proofs; make arrangements with the publishers; give directions about advertisements and the distribution of the work for review; and send copies to friends. Imprudently (and as I look back on these past days I am struck by my frequent imprudences) I went to London to transact these matters of business. Without any serious delay, everything might have been done by letter; and I ought to have remembered that London was not the place in which to find the quiet I needed.

During my short stay in London there did, indeed, occur an excitement which exacerbated my disorder. Meeting one afternoon Mr. F. O. Ward, a friend named in a

previous chapter, I was pressed by him to join a dinner-party which he was giving that evening. I resisted: telling him of my break-down and of my consequent unfitness. But he was urgent and I weakly yielded. In a letter to my father I find an account of the dinner and its effect.

"I foolishly allowed myself to be persuaded to dine last night with Ward, one of the chief sanitary men, to meet Owen and Chadwick, and Rawlinson (late sanitary commissioner in the Crimea), Simon, the sanitary officer of the City of London, and other notables. I had the audacity (to the immense amusement of Owen and other unconcerned guests) to make an attack upon all these sanitary leaders—charging them with garbling evidence, misleading the public, &c. &c. The fight lasted the whole evening, and on two or three occasions I raised an immense laugh at their expense. But as I expected, I paid for it: I got no sleep all night.

"I start to-morrow morning; and doubt not the sea-air will soon set all right."

This expectation proved, alas! immeasurably too sanguine. I had no adequate conception of the damage which preceding months had done. The pursuit of health, now commenced, was fated to be unsuccessful; for health, in the full sense of the word, was never again to be overtaken.

Here, before narrating the incidents of that long interval which, in so far as concerns my active life, was a blank, let me say something about *The Principles of Psychology*, and the reception it met with.

At the time when it was published, extremely few were prepared even to entertain its fundamental conception, much less to agree with it; and nearly all were, in virtue of their established convictions, distinctly antagonistic. Hence the average criticisms were pretty certain to be unsympathetic. Two critics, indeed, were fully appreciative —Mr. G. H. Lewes and Dr. J. D. Morell. Most were as civil as could be expected considering the difference of view. Some were decidedly hostile. Among the last was Mr. R. H. Hutton, who made the book the text for an article entitled "Modern Atheism," published in the *National*

Review, a then-existing quarterly organ of the Unitarians, of which he was one of the editors. A review so entitled was of course damaging; and the more so because it gave the cue to some other reviewers. Among all the criticisms however, favourable or unfavourable, none gave a systematic account of the book. Anyone who, though possessed by the beliefs then current alike in the scientific world and the world at large, had thought it worth while to make a brief exposition, might have written somewhat as follows:—

We are not about to review this work after the ordinary manner of reviewing; for where dissent is complete there can be none of the usual mingling of approval with disapproval. Our attitude towards the work is something like that of the Roman poet to whom the poetaster brought some verses with the request that he would erase any parts he did not like, and who replied—one erasure will suffice. We reject absolutely the entire doctrine which the book contains; and for the sufficient reason that it is founded on a fallacy. It takes for granted the hypothesis, repudiated by all men of science at the present day, that the various species of animals and plants have arisen through the successive modifications slowly produced by the working together of natural causes—"the development hypothesis" as it is called. It is true that throughout the greater part of the volume this hypothesis is not named; but towards its close Mr. Spencer distinctly avows his adhesion to it: apparently implying that he had not originally intended to do this, but at length found that the course of his argument necessitated the avowal. It seems strange that Mr. Spencer should have supposed that men intelligent enough to read his book, should not be intelligent enough to see that the development hypothesis is tacitly implied in almost every page.

Under the circumstances of the case we shall therefore limit ourselves to a *resumé* of these "principles of psychology" so fallaciously based. In doing this we shall not follow the order adopted by Mr. Spencer, which seems to us an ill-judged one. Taking first Part III, with which the work ought to have commenced, we will afterwards describe in succession Parts IV, II, and I

This "General Synthesis," as Part III is named, sets out with the proposition that a truth which any group of phenomena presents in common with the most nearly allied group of phenomena, must be its most general truth. The phenomena most nearly allied to those of mind are those of bodily life: the two being specialized divisions of the phenomena of life at large. Life, Mr. Spencer contends, is made up of changes connected in such ways as to have a certain correspondence with connected actions and agencies in the environment; or, in other words, it is a continuous adjustment of inner relations to outer relations. He says that the degree of life varies as the degree of correspondence; and then he traces the increase of the

correspondence through ascending forms of life, in a series of chapters in which it is described "as direct and homogeneous"; "as direct but heterogeneous"; "as extending in space"; "as extending in time"; "as increasing in speciality"; "as increasing in generality"; "as increasing in complexity &c.". The general argument running through these chapters is that the form of life which we call mind, emerges out of bodily life and becomes distinguished from it, in proportion as these several traits of the correspondence become more marked.

In the next part, "Special Synthesis", an endeavour is made to show in what way this gradually increasing correspondence between relations among changes in the organism and relations among phenomena in the environment, is established. The first proposition is that the changes constituting intelligence are in the main distinguished from the changes constituting bodily life by being serial only, instead of being both serial and simultaneous: their seriality becoming more marked as intelligence increases, and becoming conspicuous in the highest intellectual processes, such as reasoning. The next proposition is that to effect a correspondence between the relations among mental states and the relations among external phenomena, it is needful that the tendencies of the various mental states to cohere in consciousness, must be proportionate to the degrees of constancy of the connexions between the environing phenomena they represent. And the third proposition is that the establishment of this kind of adjustment between inner relations among states and outer relations among phenomena, is step by step effected by the experiences of the outer relations among phenomena. The familiar doctrine of association here undergoes a great extension; for it is held that not only in the individual do ideas become connected when in experience the things producing them have repeatedly occurred together, but that such results of repeated occurrences accumulate in successions of individuals: the effects of associations are supposed to be transmitted as modifications of the nervous system. Succeeding chapters apply this theory to the interpretation of "Reflex Action," "Instinct", "Memory", "Reason", "The Feelings", and "the Will". It is needless here to follow the argument in detail. Suffice it to say that beginning with those simple automatic actions carried on by finished nervous connexions, which are of such nature that on a stimulus being applied the appropriate motion irresistibly follows; and passing on to instincts, which are regarded as compound reflex actions in which a combined cluster of stimuli produce automatically a combined cluster of motions; Mr. Spencer argues that in proportion as the connected antecedents and consequents in the environment become more involved, and in proportion as the connected clusters of internal changes, answering to them respectively, also become more involved, the sequences, alike internal and external, are at once less frequent and less unvarying in character. The result is that the clusters of internal changes, no longer being exactly adjusted and unhesitating, there occur brief times during which certain of them take place hesitatingly or slowly, and become appreciable parts of a consciousness; and thus conscious perception, memory,

reason &c. become nascent. Evidently the theory everywhere implied in this part, as in the preceding part, is that all types of mind, animal and human, are products of a perpetual converse between organism and environment; the effects of which are, generation after generation, registered as minute structural changes in the nervous system; and that along the various lines of descent which have ended in the various types of animals now existing, there have been thus produced those different nervous organizations adjusted to their respective habits of life.

Of course if Mind has been actually built up by this process, it can be, if not actually, yet theoretically, unbuilt by a reverse process. If it is composed of inner relations adjusted to outer relations, then it can be resolved into such inner relations. Mr. Spencer does not say this but apparently assumes it; and he seems to have written the part entitled "Special Analysis", for the purpose of exhibiting the resolution of Mind into such components. Limiting himself to intellectual actions, he begins with the most involved of these—compound quantitative reasoning. This he aims to show is at every step a recognition of equality or inequality between relations severally existing between two clusters of equal relations. Descending through less involved forms of quantitative reasoning and coming down to ordinary reasoning, he argues that this differs only in the respect that the compared relations, no longer of measurable kinds, are now recognized not as equal or unequal but as like or unlike. In a succeeding chapter on classification, naming, and recognition, he finds no difficulty in showing that these mental acts are effected by the assimilation of clusters of relations (along with the impressions between which they exist), to their likes in past experience. There come next a number of chapters in which a kindred analysis of our perceptions is attempted—first those of special objects, then those of body, as presenting its several classes of attributes, and then those of space, time, motion and resistance: the aim throughout being to show that in every process of perception, a cluster of mental states, held together in relations like previously known relations, is partially or wholly classed with clusters previously known that were similarly composed. Mr. Spencer then proceeds to the relations themselves, grouping them as relations of Co-intension, Co-extension, Co-existence, Con-nature. At length he comes down to the ultimate relations of Likeness and Unlikeness, out of the variously compounded consciousnesses of which, he contends that all acts of intelligence are framed. In the closing chapter he insists upon this "unity of composition," as he calls it: regarding it as evidence of the truth of his analysis, and apparently regarding it also as justifying his general theory. For if Mind is resolvable into continually established relations among states of consciousness, the conclusion harmonizes with the theory that Life is a continuous adjustment of inner relations to outer relations, and that Mind emerges from it as fast as the adjustment becomes more extended, more involved, and more complete.

The remaining part, "General Analysis," which in the work itself comes first, is, it seems, an elaboration of an Essay entitled "The Universal

Postulate," originally published in *The Westminster Review*. Its subject-matter, otherwise described, is the ultimate criterion of belief; and its thesis is that in the last resort we must accept as true a proposition of which the negation is inconceivable. One might have expected that in discussing this topic, there would be no occasion for reference to the theory pervading the rest of the book. Nevertheless it is brought in by implication. Dealing with beliefs as products of experience, and contending that those beliefs of which the terms have been most frequently connected in experience are those which have the best warrant, Mr. Spencer holds that those of which the terms have been connected in experience perpetually, and without exception, are those of which the negations become inconceivable. And it appears that, regarding the effects wrought on the nervous system as transmissible; and thinking that these effects produce, by accumulation, organic connexions; he holds that those which have been repeated perpetually and uniformly in the experiences of all preceding generations produce "forms of thought."

Succinctly stated, these are the doctrines set forth in *The Principles of Psychology*. It seems not improbable that here and there a credulous reader will be misled by the coherence and symmetry of the theory into acceptance of it: forgetting that it is based on an assumption which is not only entirely unwarranted, but which, directly at variance with Revelation, is rejected alike by all people of common sense and by all authorities in Science who have expressed their opinions. It is, indeed, strange that any one should have had the courage, not to say the audacity, to base an elaborate theory upon a postulate thus universally discredited. We suspect that hereafter Mr. Spencer's volume will be relegated to a shelf on which are grouped together the curiosities of speculation.

Some such review as this might, with a little license of imagination, be supposed to have been written when the work was published in 1855. I say with a little license of imagination, because any one accepting, as the review implies, the beliefs concerning the organic world current at that time, would have been unlikely to bestow so much trouble in making an abstract. The days were days when the special-creation doctrine passed almost unquestioned. Though for the interpretation of the structure of the Earth's crust, miracle was no longer invoked, it was invoked for the interpretation of the fossils imbedded in the Earth's crust. This was unhesitatingly regarded by nearly all as a rational compromise; and any one expressing dissent was liable to be laughed at.

CHAPTER XXXII.

EIGHTEEN MONTHS LOST.

1855—56. ÆT. 35—36.

TRÉPORT had proved so beneficial during my month's stay the year before, that I decided to revisit it after my break-down. My friend Lott, who was invalided by a lame knee, agreed to follow me; and he arrived at the end of August, after I had been at Tréport about ten days.

Sometimes basking on the shingle, sometimes collecting specimens for two aquaria which we established—now taking rides and now spending an hour at the *Salon* near the sea, or at the shooting-gallery, we remained at Tréport till September 18, with varying results in respect of health, and then returned by way of Calais and Dover. Next day we parted at Folkestone, where I remained a week.

Huxley, then recently married, was spending his honeymoon at Tenby; and I wrote to him making inquiries about the place. The result was that at the end of the week I journeyed thither. Letters show that I had hoped to benefit by going out dredging, and also by the pleasures of companionship. But I was disappointed. My state was such that I had to shun society: being unable to bear more than a few minutes' conversation. I describe myself as "leading a very quiet life, looking at neither books nor newspapers"; and I enlivened my solitude by exploring St. Catherine's Rock and its caves for creatures to fill my aquarium, and by watching their habits.

Reading the correspondence of these and subsequent

months has somewhat changed my conception of myself. Having all through life had an even flow of spirits, unvaried by either elation or depression, I have usually supposed that I tended towards neither sanguine nor despondent views. But my statements and anticipations at this time make me think that I must be constitutionally sanguine. On the average, letters give the impression that satisfactory progress is being made, and that recovery may be looked for in a short time—an impression not at all congruous with my recollections. Here is a paragraph from a letter of 10 October, which I quote partly in illustration of this trait and partly because of the fact it contains.

"The average of my nights is better, though they vary a good deal. Last night was my best for a long while, in consequence apparently, of my having adopted a new and more efficient mode of keeping up the cerebral circulation through the night. I wet the head with salt and water; put over it a flannel night cap; and over that a waterproof cap which prevents evaporation. The effect is that of a poultice. Last night I did not lose more than two hours between 10 and 7. I woke in the middle of the night, and by repeating the wetting went to sleep again in about an hour. If this plan continues to answer I shall do very well; for sleep is all that is wanted."

But it did not continue to answer, and yet there is no mention of its failure. It may be that I was anxious to put the best face on matters when writing home. That the desire to relieve the fears entertained about me, was a part cause of these unduly favourable reports, I am the more led to suspect on finding no reference to the serious exacerbation of my disorder produced, when at Tréport, by reading a little too much while under the influence of quinine, joined with that of other tonic treatment, and producing a state of hot head which lasted for several days. This imprudence it was, I believe, which made permanent a morbid condition that might otherwise have been but temporary.

At the beginning of November I returned to Derby, much worse than I was when I left it early in August.

Not many years previously had settled at *Nottingham*,

Dr. W. H. Ransom—a physician who presently became the leader of his profession in that place. My father suggested that I should consult him, and we went over together. Dr. Ransom was a specially fit adviser; for he had himself been a nervous sufferer. Attainment of the highest honours at his examination had been followed by a collapse from which it took a long time to recover.

He entered very fully into my case, telling me for my guidance various results of his own experience. I remember the shock given me by the statement that two years had elapsed before he was able to resume work: the implication being that the like might be the case with me. Ah! if I had known what the future was to bring forth, how I should have rejoiced over the prospect of a termination to my disorder—even though delayed for that interval.

Of his various suggestions I need here name only that which determined my movements for some time after. He said I ought to lead a rural life: taking up my abode in a farm-house where, among other things, I could have the use of a horse. On naming Devonshire as a region towards which I had leanings (letters show that I had thought of crossing over from Tenby) he demurred somewhat on the ground of climate; but as he did not insist much on this objection I decided to go there.

A brief interval elapsed before an advertisement in the Devonshire papers had any result; and then the result was only a single reply. This promised fairly well, and I therefore journeyed to the south-west early in December.

The place at which I settled myself for a time, was Well House, Ideford, near Chudleigh. Besides myself there were, as inmates, an ensign from India on furlough, and his brother. Joined to the family, which included a governess, these made a sufficiently lively circle. A letter home, dated December 11, says—

"I have been riding yesterday and to-day, and have enjoyed it much. The scenery all round is very beautiful—more so even than I had expected.

So far the climate is anything but relaxing: it has been a sharp frost ever since I have been here. Last year there was a month's skating on the water in Ugbrook Park, close by here—one of the most picturesque parks I have seen."

And then comes a sentence illustrative of my sanguineness:—"At the present rate I shall soon be quite right; for I feel quite well, and sleep pretty nearly as well as I ordinarily do."

Daily rides along the Devonshire lanes, now to Bishopsteignton, Teignmouth, or Dawlish, and now on the top of Haldon, passed the time pleasantly; and indoors, occasional hours were passed with the microscope, in the use of which I was trying an experiment. Thinking that in many cases greater power of penetration is the need, rather than more exact definition of such part of an object as lies in focal plane, it occurred to me that instead of the object glass having a wide aperture, the aperture should be the smallest which would admit a sufficiency of light. I therefore had made for me a movable cap to the object glass, having in its centre an opening about the size of a pin-hole; and, for illumination, I used direct sunlight passed through oiled tissue paper, to destroy the parallelism of the rays. The experiment was not without success; but I was, I believe, deterred from prosecuting it by finding that the rays diffracted by the edges of the hole interfered too much.

Let me name here an instructive fact which I observed during my stay. On Christmas Eve I thought I would amuse my host's little daughter by showing her how a holly-berry with a pin thrust through it, will dance about in a vertical jet of air, in the same way that a ball does when placed in a jet of water. The farmer, a man of substance but of very little culture, was looking on; and I expected that he would show astonishment and curiosity on seeing for the first time so anomalous a behaviour. To my surprise he did neither; but displayed absolute indifference. Many years afterwards I was reminded of this experience by the accounts given of the comparative

indifference which low savages display, when shown looking-glasses, watches, or other remarkable products of civilized life. Surprise and curiosity are not traits of the utterly ignorant, as they are commonly supposed to be, but of the partially cultured; and non-recognition of this truth vitiates the speculations of mythologists. They tacitly assume that the primitive man wonders at those great natural changes in the Heavens and on the Earth which he daily witnesses, and tries to account for them. But it is quite otherwise. He does not concern himself about them any further than as they affect satisfaction of his material needs. If a member of the Max Müller school would cross-examine a few rustics concerning the Moon's phases, he would see how baseless is his supposition respecting the mental states of the early races whose ideas he so definitely describes. No villager marvels at the monthly changes of the Moon; nor does he ever think of asking from an educated person how they are caused. Nay, if an explanation is volunteered he shows no interest. All through life he looks at these perpetual transformations with entire indifference: unless, indeed, in so far as he fancies they affect the weather.

Before the end of the first week in January I had become impatient with my slow progress at Ideford and decided to try Marychurch near Torquay. After two days there I concluded that, except in frosty weather, the climate of Devonshire was too relaxing; and thereupon decided to go home and find some place in the North.

A change of decision which took place while on my way, is indicated in the following letter; which I give in full because all parts of it are relevant to one or other point of interest.

Lanes Farm, Brimsfield Nr. Painswick
22 Jany. '56.

"My dear Potter

Your letter reached me in Devonshire—the last region to which I had wandered in search of health—just as I was leaving in consequence of

finding the climate too mild. On my journey towards home it occurred to me to try the Cotswold Hills, which seemed likely enough to furnish a keen bracing air; and I have for the last ten days been seeking an abode.

"I postponed replying to your letter until I had settled myself; and now that I have done so, I find the place and climate so unsuitable that I am thinking of going on Friday.

"I should very much like to accept your kind invitation before going back to Derby; but I am almost afraid to do so. I am obliged to shun intellectual society: being unable to bear the excitement of it without injury. It seems beforehand very easy to avoid argument or disquisition; but in practice I find it next to impossible when the temptation arises. It will, I think, be most prudent to relinquish the various gratifications which your invitation holds out, until I can partake of them with less risk.

"I am perfectly willing to try your remedy for rationalism. Indeed, marriage has been prescribed as a means of setting my brain right in quite another sense: the companionship of a wife being considered the best distraction—in the French not in the English meaning of the word. But the advice is difficult to follow. I labour under the double difficulty that my choice is very limited and that I am not easy to please. Moral and intellectual beauties do not by themselves suffice to attract me; and owing to the stupidity of our educational system it is rare to find them united to a good physique. Moreover there is the pecuniary difficulty. Literature, and especially philosophical literature, pays badly. If I married I should soon have to kill myself to get a living. So, all things considered, the chances are that I shall continue a melancholy Cœlebs to the end of my days.

"Putting two and two together, I have my suspicions respecting the authorship of *Laura Gay*. But I will say nothing until I have internal evidence. My address has been too uncertain to admit of the copy which has been sent to me at Derby being forwarded. With kindest regards to Mrs. Potter and yourself,

I am
very sincerely yours
Herbert Spencer."

In response to a letter from Mrs. Potter, received a few days later, re-inforcing the advice given in the letter replied to as above, I wrote—

"Thank you very heartily for your expression of sympathy and interest in my welfare. It is long since I have received a letter that has given me so much pleasure. Friendly words are so generally forms rather than realities, that when they bear the stamp of genuineness they produce an unusual effect.

"You are doubtless perfectly right in attributing my present state to an exclusively intellectual life; and in prescribing exercise of the affections as the best remedy. No one is more thoroughly convinced than I am that bachelorhood is an unnatural and very injurious state. Ever since I was a boy (when I was unfortunate in having no brothers or sisters) I have been

longing to have my affections called out. I have been in the habit of considering myself but half alive; and have often said that I hoped to begin to live some day. But my wandering, unsettled life, my unattractive manners towards those in whom I feel no interest, my habit of arguing and of offending opponents by a disrespectful style of treating them, have been so many difficulties in my way."

The unsuitableness of the Brimsfield climate I had prematurely inferred from the fact that the high land of the Cotswolds was frequently wrapt in low-lying clouds at a time when the Severn valley was clear; and I supposed that this kind of dampness was enervating. But it proved not to have the same effect as the warm dampness of Devonshire. My eventual return home about the second week in February, was chiefly due to the departure of another invalid who had been staying at Lanes Farm. This left me companionless: a state of things I always found injurious. Less than three weeks at Derby sufficed. The impatience which I suppose was one result of my disorder sent me back to Brimsfield; and I find a letter dated 1 March, the day after my arrival there, in which occurs the paragraph—"I have just had my first bout of hard work and my first doze. I feel well and strong and tolerably stupid."

Now exploring the neighbouring country and visiting on one occasion the remains of a Roman villa, now sauntering along the hedge-sides with gun in hand, now splitting up tree-stumps (which occupation, as having some little interest, proved the best exercise I tried) and now riding quietly along the lanes, I passed another three weeks at Brimsfield. Neither there nor in Devonshire did riding seem to be of much service; and I suppose for the reason that I never rode hard enough. I habitually brought back my horse without a hair turned. Having always myself had an intolerance of strenuous effort, and especially effort under coercion, my sympathy is aroused by any creature making strenuous effort under coercion; and the result has ever been a dislike to seeing either a man or an animal over-pressed,

and still more to over-pressing one myself. It is curious how special the sympathies are. Mine are by no means as active in most directions as they are in this.

Reports written home from Brimsfield are as usual favourable, and on the whole it seems with reason; for I describe myself as having read "more than a third of the last volume" of a novel "in one day without any injury." Of course I did this third by instalments; but it was a feat for me in those days. Insomnia persisted; and I frequently adopted heroic measures. In the middle of the night I got up and took a shower bath: the reaction serving to induce sleep. The most effectual method I discovered (not then, however, but afterwards) was a kind of mild hydropathic pack.

One morning there arrived at the door a groom on horseback. He came from Standish, which was less than ten miles off, bearing a letter again asking me to visit my friends there. Though doubting my ability to bear the social excitement that would be entailed, I assented, and bid good-bye to Brimsfield on the 22nd of March.

On the evening of my arrival at Standish, Mrs. Potter made an announcement which would have tried the nerves of many people in full health. She quietly told me that she was about to put me into a haunted room—a room in which one of her brothers had seen a ghost, and from which he had hurriedly departed next morning, almost without stopping to say good-bye, and had never been induced to sleep in the house since. I suppose she desired to put my disbelief to the test; but it was rather a sharp test for one labouring under a nervous disorder, whose nights were always broken by long waking intervals. Moreover, the failure to withstand such a test would have proved but little; for absolute as is the disbelief, early associations may so perturb the imagination as to throw judgment off its balance. Just as the eating of a dish of frogs or snails is

to the ordinary Englishman rendered impossible by consciousness of its nature, though he may admit that his prejudice is absurd; so, in spite of himself, one who with entire confidence rejects the belief in ghosts may, in places where they are supposed to appear, be unable to expel the dread that was instilled by nursemaids and strengthened by stories of the supernatural afterwards read. However, in my case, early associations failed to have any such influence. I slept in the room for three weeks and saw nothing: sometimes occupying my waking intervals in speculating about the possible origin of the illusion.

Here, as at Brimsfield, I followed the policy of occupying myself in ways which, while involving exercise, absorbed the attention. I am reminded of some of these ways by passages in a letter to my mother written on March 29.

"My father's letter found me busy making a swing for the children. It has given them great delight. I am busy establishing a vivarium for them. . . . These various occupations, and the society, cause me quite to forget myself, which is a great point. . . .

"Probably I shall go up to London in a week or ten days hence. Dr. Ransom is right. Moderate excitement is beneficial; and I doubt not the London amusements will do me good."

A letter home dated 9 April, explaining my continued presence at Standish as due to the kind pressure of my friends, names the 12th as my last day there.

A sojourn in London followed. To maintain the continuity of the narrative I give a few extracts from letters written while there. One of April 13 says—

"I had a good deal of excitement yesterday, having seen and talked with Chapman, Huxley, Mrs. Huxley, Pigott, Lewes, and having in the evening attended one of Hullah's orchestral concerts, where I remained 2½ hours. I got from 5 to 6 hours' sleep after it; which, considering it was my first day in London, was quite as much as I expected. . . .

"As soon as I have done this I am going off to Mortlake (on the Thames) to spend the day with Pigott, who has got rooms in one of the lodges of Richmond Park, one side of which touches Mortlake. Pigott tells me to regard his quarters as my country house, where there is a bed always at my service.

On Tuesday I go down to spend the day with Lewes at Richmond. On the whole I think I shall spend my time pleasantly and beneficially."

Under date 21 April, I wrote to my uncle William—

"Cannot you give yourself a holiday and come up to town while I am here. I am playing the lounger—going sight-seeing and amusing myself as best I may. Your company would be an acquisition; and as I have nothing else to do, I could put myself at your disposal in the way of seeing all that is to be seen. . . .

"I have improved considerably during the week that I have been here. There is plenty to occupy the attention, and plenty of stimulus to walking—both of them important points.

"By the way it occurs to me that there are shortly to be rejoicings for the peace—a review, a grand display of fireworks, &c.—and you might time your visit so as to come in for them."

To my father on 28th April, I said—

"I am very unlucky at present in respect to society. Almost all the families at which I visit are from one cause or other invisible. The Coopers have taken lodgings at Wimbledon for three months. The Octavius Smiths are gone to live at Brighton. Mrs. Swanwick is dead, and her daughters do not receive at present. Chapman has ceased to give any parties. . . .

"There are but 200 copies of the *Psychology* sold, but the sale is going on pretty steadily."

As I had printed 750, and as the chief sales of a book usually take place soon after its publication, this sale of only 200 copies during the first nine months, implied that a heavy loss was coming upon me. It showed, too, how pecuniarily wise had been the publishers who declined to undertake the risk, or any considerable part of it. A letter home dated 2 May contains the paragraph:—

"I have just accepted an invitation to join a yachting excursion of 10 days to Jersey, Guernsey, and Cherbourg. Pigott's brother is the owner of the yacht, and Pigott and some others are going with him. It will be just the thing for me. We start this day fortnight."

On May 17, I wrote:—

"I am going down to Brighton for a few days. Our yachting excursion is postponed for a fortnight; the vessel not being ready. I want to try the effect of sea-bathing."

The next letter to my father, dated 30 May, contains a paragraph which, on looking through my letters, I re-read with special interest; since it refers to what proved to be the initiation of a long series of pleasures.

"We leave for Southampton at 10 to-morrow, and our yacht starts the

same evening. We are to be away ten days. On my return I shall stay only a few days in London; after which I am to go and see the Brays at Coventry, and thence I propose to come to Derby for a week.

"Mr. Octavius Smith, whose name you may have heard me mention, and who has a house on the west coast of Scotland, where he is going with his family in about a month, has kindly invited me to join them there. This will suit me admirably, and I have of course accepted it with gladness. . . .

"I was with the family last night seeing the fireworks. We had to go into the Green Park on foot, and in the crush I was robbed of my watch and Mr. Smith of his. The fireworks were very splendid."

During my many years of London life this was the only loss by theft which I ever suffered; and I should not have suffered this had I been led to expect that we might go into a crowd.

The suspicion, indicated at the beginning of this chapter, that my letters home habitually gave too favourable an account of my health, is confirmed by finding in the series of them just quoted from, no mention of the serious relapse I experienced while in London. Mr. Fraser, now Professor Fraser, of Edinburgh, was a candidate for the chair then vacated by the death of Sir W. Hamilton, and wrote to me for a testimonial. I had read nothing of his, and was unfitted to express any opinion; but I did not like to give this as a reason for declining. I thought I might be able to read as much as was requisite, and I did so; but the result was a break-down, and an undoing of what good had been done during some previous months. I have often described myself as having an unusual ability to say "No;" but on now having recalled to me the events of past years, I find that lack of the nerve required to say "No" has been a cause of numerous disasters.

Our yachting excursion was made in fulfilment of the arrangement indicated above, and my next letter home is dated Marshall's Royal Yacht Hotel, Guernsey, 5 June. It says—

"We arrived safely at Guernsey on Tuesday evening, after being becalmed in the Channel for a day and a half. I slept badly on board but have had two good nights here [at the hotel]. I think I am benefiting, but I should

benefit more if . . . The first day the breakfast did not take place *till after* 2 *o'clock*. I, however, had managed to get something at 10½.

"We dine to day with Victor Hugo, to whom Pigott brought letters of introduction [from Louis Blanc]; and to morrow we leave for Jersey, where we shall stay a day before going on to Cherbourg."

There was nothing particularly impressive in Victor Hugo's appearance or manner. My inability to follow French conversation with any facility, prevented me from appreciating what he said during dinner, or what he said afterwards, when we were occupied in playing some kind of game in his garden. Two things only I remember. He coupled the names of Bacon and Comte; and when he came down to see the yacht, the cabin, quite ordinarily fitted up, drew from him the words—*rêve d'un poète*: a phrase characteristic of his style. Madame Hugo was a much more striking person; answering completely to one's idea of an old Roman dame. The two sons, also, were fine young fellows. The elder, whose name I did not hear, favoured the mother; while the younger, François Victor, was more of his father's type. He was then busy with his translation of Shakespeare.

The rest of our cruise, carried out according to programme, brought no events of interest. It was prosperous: gentle breezes and sunny seas attending us throughout. The result was that we reached Portsmouth at the appointed time, and I was back in London on the 11th.

On the 16th I went home for a week; and then, leaving Derby for Coventry, spent a few days with the Brays at Rosehill. These visits were made on my way north. The friends with whom I was to spend part of the autumn in Argyllshire had not yet left town; but as I had seen enough of town, I decided to go to Scotland in advance, and there spend the time in rambling about and fishing until I received an intimation that they were expecting me.

I believe I had intended to go direct to Oban; but a fellow-traveller on the Glasgow and South Western line,

seeing my fishing gear, and inquiring my intentions, recommended to me as a fishing place, Loch Doon, the head water of the River Doon, famed in song. Forthwith acting on his advice, I left the railway at New Cumnock, and made my way across country to Dalmellington. From there, in pursuance of information, I made my way to a farm-house on the shores of the Loch, where I obtained accommodation. The house was called Beoch; and thence I wrote home on the 10th July in the usual sanguine strain.

"I have been here now nearly a week, and find this life suits me very well: better indeed than any I have yet tried. I am sleeping now fully seven hours every night, besides a short nap in the day; and the sleep is better than it was. So you see I am on the way for getting right. I walk from ten to twelve miles a day—some of it very rough walking and equal to more in distance—and I find now that the more I walk the better I sleep. The fishing, too, suits me well, and passes the time pleasantly.

"I am in a farm-house among mountains and moors with scarcely a tree or anything else upon them. I should think it dreary enough if I had to stay here long. At the end of the week I leave for Oban."

My constitutional tendency to call in question current opinions, was manifested when fishing, as on other occasions. While in Wales the year before, occupied in writing on Psychology and occasionally casting a fly over stream or llyn, it occurred to me that considering how low is the nervous organization of fishes, it is unlikely that they should be able to discriminate so nicely as the current ideas respecting artificial flies imply—unlikely, too, that they should have such erratic fancies as to be taken by combinations of differently coloured feathers, like no living creature ever seen. I acted upon my scepticism, and ignored the local traditions. Hearing me vent my heresies, the farmer, tenant of Beoch, challenged me to a competition. It was scarcely a fair one; for my flies, made by myself without practice, were of course ill-made, and the bungling make of them introduced an irrelevant factor into the competition. Notwithstanding this, however, fishing from the same boat we came back ties; showing that the local flies had no advantage. I may add here that in

subsequent years I systematically tested this current belief in local flies; and on various lochs and four different rivers found it baseless. This experience furnished me with a good illustration of the uncritical habits of thought characteristic not of the common people only but of those who have received University educations. For in every case I have found highly cultivated men—professors and others such—accepting without hesitation the dogmas of keepers and gillies concerning the flies of the river. Always their assigned reason is that these dogmas express the results of experience. But inquiry would show that those who utter them have never established them by comparisons of numerical results. They simply repeat, and act upon, what they have been told by their predecessors; never dreaming of methodically testing their predecessor's statements by trying whether, all other things being equal, other colours and mixtures of colours would not answer as well. The delusion results from pursuing what, in inductive logic, is called the method of agreement, and not checking its results by the method of difference.

Another incident which occurred during my stay at Beoch, was impressed on my memory by certain implications to which it awakened my attention. While out fishing one breezy morning, I got my line into a tangle, which I could not unravel; and at length, losing all patience, I vented an oath. The man in the boat with me, who, as I afterwards learned, was precentor at some neighbouring village kirk or chapel, reproved me: perhaps thinking himself called upon to do so by his semi-ecclesiastical function. I suppose it was the oddity of this incident which drew my attention to the fact that, being then thirty-six years of age, I had never before been betrayed into intemperate speech of such kind: thus making me more fully aware than before of the irritability produced by my nervous disorder.

And here let me pause to make some general remarks suggested by this incident—remarks intended to convey a

warning to those who are in the habit of greatly taxing their brains. That I may the better do this, let me ignore for a moment the order of events.

I will begin by extracts from letters; the first of which, written to a friend thirty years later, during the worst phase of my nervous disorder, refers to the frequent relapses which I was undergoing.

"I want a keeper, to be always taking care that I do not overstep the limits on one side or the other; for a consequence of my present condition is that I lack judgment and presence of mind, and commit some imprudence or other before I am aware of it."

The second extract is from the reply made by my friend, himself suffering under a long-established nervous disorder, who had recently passed through a severe crisis.

"Your note contains sentences of intense interest to me; for the lack of judgment and of presence of mind which you there glance at, was one of the features of my malady, when at its worst, causing me to commit imprudence as you say before I was aware of doing so."

These two testimonies, so curiously coincident, illustrate the truth that under a lowered condition of the nervous system, failure is first manifest in the highest intellectual co-ordinations and in the highest emotional co-ordinations. Speaking generally, each step in mental evolution results in a faculty by which the simpler pre-existing faculties have their respective actions so combined that each aids in regulating or controlling the others, and the actions of all are harmonized. Each higher judgment differs from lower judgments in that it takes account of more numerous factors, or more correctly estimates their degrees of relative importance; and is thus a more complex mental act. And similarly, among the higher feelings, all relatively complex, the highest are those which stand related to lower ones as moderators: their moderating function being effected by combining within themselves representations of these lower feelings, no one of which is allowed to occupy more than its due share of consciousness, and there-

fore is not allowed unduly to sway the conduct. Manifestly, by their very natures as thus understood, these highest intellectual and emotional powers, by which well-balanced judgments are reached and well-balanced feelings maintained, require more than all others, a full flow of nervous energy—a flow sufficient to *simultaneously* supply all the numerous structures called into action. Consequently, they, before all others, fail when the tide of nervous energy ebbs. Defect of co-ordination is shown intellectually in erroneous judgments concerning matters where sundry circumstances have to be taken into account, and emotionally in the ill-controlled feelings which lead to impulsive expressions and deeds. The primitive and deeply-rooted self-regarding faculties, which tend ever to initiate antagonisms, are scarcely weakened during states of prostration; while the other-regarding faculties, relatively modern and superficial, and soon paralyzed by innutrition, fail to check them. And then beyond the direct evils which the nervous subject brings on himself by such failures, there are the indirect evils that result from misinterpretation of his character. The irritabilities and perversities of those who are visibly ill, are duly allowed for: they are understood as temporary consequences of the temporary state. But those who, not being visibly deranged in health, suffer from these chronic nervous disorders, have no allowances made for them. I am the more impressed by this fact on remembering the case of my father, and the constructions which I myself put upon his ideas and actions. His not infrequent aberrations of judgment, and his often-displayed peculiarities of temper, I regarded as traits of his original nature. But of late years it has become manifest to me that they were the results of that debility of brain which he brought on himself during my childhood, and that I never knew his true character.

The last fortnight of July was spent at Oban; and, waiting as I was for promised pleasures, the time passed

heavily. There were explorings of Dunolly and Dunstaffnage castles; a walk to Taynuilt, and a return next day. There was a little trout fishing in a loch among the hills a few miles off; and there was a little sea fishing in Loch Linnhe, outside the island of Kerrera. But I was glad when, at the close of the month, the looked-for letter arrived, and I departed for Achranich.

Anyone leaving Oban by steamer for the West, enters, after crossing Loch Linnhe, the Sound of Mull, flanked on the left by the Mull mountains and on the right by the precipitous shores of the mainland. These last are the Ardtornish cliffs. Over them in rainy weather fall several small streams, in such wise that, during violent south-westerly gales, they are blown back and dispersed in great clouds of spray: producing, at a distance, the impression that fires at the edge of the cliff are sending forth volumes of smoke.

Some two miles or more down the Sound, on the right hand, juts out a promontory which bears on its brow the ruins of Ardtornish Castle, the scene of the *Lord of the Isles;* in which poem, however, this castle is greatly idealized, for it could never have been of considerable size. A mile further along the same shore is the narrow opening of a small sea loch: on one side of it a ferry-house, and on the other a village bearing the same name as the loch—Loch Aline. Visible only for a minute as the steamer passes its mouth, Loch Aline is seen to have on its two sides cliffs clothed with trees up to their summits. Closing the loch, about two and a half miles from its mouth, rise partially wooded hills, and beyond these, mountains. In 1856 no sign of human habitation was visible on its shores. At the far end where, in later years, might be discerned a building peeping through the trees, there then existed only the foundations of one. The house which gave the name to the place, concealed in the mouth of a valley at the head of the loch, was a farm-house which Mr. Octavius

Smith had enlarged; and which, with new offices intended to be permanent, gave accommodation to the family and guests while the new house was being built.

Here I joined a domestic circle already increased by two lady-friends—a circle which was rendered none the less charming by the comparative unconventionality resulting from temporary arrangements. Already in a preceding chapter I have briefly characterized my host, and will here add only that to his larger kindnesses were often added smaller ones; as, for instance, when from the dog-kennel a hundred yards from the house there came one night the baying of pointers and setters, which he knew would keep me awake, he got up and went out to try and silence them. Of my hostess, however, I have as yet said nothing; and she must not be passed over. I should think that in her early days she answered in large measure to one of Shakspeare's portraits—"pretty and witty, wild and yet, too, gentle": wildness being the only trait of which there was no trace. In the days of which I speak, griefs from domestic afflictions—losses and illnesses of children—had left obscuring marks; but there survived the never-failing amiability, and her sympathies with those around frequently made her contribute a little humour to conversation. The only fault I can recall was that of undue self-sacrifice—a fault on which I sometimes commented; for my compliments, rarely uttered in any form, were apt to take the form of criticisms. When I add that the sons and daughters furnished no evidence against the general principle of heredity, I have described a group in which life could not but pass delightfully. A letter written home on the 16th August says—

"I am enjoying myself much here—so much so that I think scarcely at all about myself or my ailments. The days slip by very quickly—so much so that there generally seems no time for anything. Fishing, and rambling, and boating, and bathing, form the staple occupations; varied, occasionally, with making artificial flies and mending fishing rods. My friends are delightful people—extremely kind and considerate, cultivated and amusing. The first few days of my stay were rather too exciting, but I soon became

accustomed to it, and now do not feel it at all. My sleep is much as it was; but though it is still broken I am decidedly progressing in ability to read, and talk, and write, without ill effects. I do not remember to have had any sensations in the head for a week or more."

During my stay there were picnics on the Table of Lorne (a flat-topped mountain visible from Oban) and at the Ullin waterfalls; ascents of Ben Yahten and Shean, whence there are fine views of Rum and Skye; drives to the village, to Ardtornish, to Glen Dhu, &c.; a boating excursion round to Loch Linnhe, with a picnic on its rocky wood-clothed shore; a sketching trip to Killoonden Castle; and many days on the banks of the river Aline, or Aline water, and on Loch Arienas, during which I justified my heresy by catching great numbers of sea trout. In these ways six weeks rapidly went by. A letter to my father dated 9 September contains the paragraphs:—

"My kind friends here have induced me to stay longer than I thought of doing when I last wrote to you: they ask me to stay as long as is agreeable to myself."

Intimating that I should probably not remain more than another week, the letter continues:—

"It will now be too late to go to Tréport, as the season there closes at the end of the month, and practically ends before that time. I am therefore thinking of going to Brighton instead. Brighton suited me very well during the week I spent there in the spring; and I think that its bracing air, after this mild and rather enervating air, will be very beneficial.

"I am increasing in power of reading, but I still do not sleep well; though, I think, better on the average than heretofore. I am getting very stupid, which I suppose I must take as a good sign."

Every one now and then has presentiments. They sometimes force themselves on one in spite of one's consciousness of their absurdity. I have had many; but never yet found one verified. A day or two before leaving Achranich the daughter of the house, an accomplished musician, had been singing a song of Tennyson's, then recently set to music, "The Brook," of which the burden is—

"No more by thee my steps shall be,
For ever and for ever."

While pacing along the banks of the Aline, somewhat saddened by the prospect of farewell to pleasant scenes, I

applied these lines to myself: believing I should not see the place again. Never was presentiment more conspicuously falsified. My visits there during many subsequent years, numbered more than twelve if less than twenty; and varying in duration as they did from a month to six weeks and even two months, they would, if added together, make between one and two years—a portion of my life which I would gladly live over again just as it was.

My departure from Achranich was followed by another interval of restless wandering. The next letter home was dated Edinburgh, 15 September, and intimated that I was about to take Derby on my way to Brighton. Subsequent dates imply that I spent a fortnight at home; for the next letter is dated Brighton, 7 October. This letter says—

"Brighton is not suiting me so well as I thought. It is becoming mild and damp and injures my sleeping. Mrs. Potter says that though it is bracing in the spring it is relaxing in the autumn. [This depends on the position—I have never found the East Cliff relaxing.] I have therefore resolved to change, and think of going to Paris."

In pursuance of this intention I left in a few days, and took London on my way. Two incidents resulting from this detour claim mention. One is that during the few days it occupied I went down to spend an afternoon and evening with the Leweses at Park Shot, Richmond; and when, during the evening, I was once more suggesting to Miss Evans that she should write fiction, was told by her that she had commenced, and had then in hand "The Sad Story of the Rev. Amos Barton": this confession being made under promise on my part of absolute secrecy. The other is that while in London I called on Chapman, and that he, learning where I was about to go, gave me a commission to execute. He explained that when he published Miss Martineau's abridged translation of the *Philosophie Positive*, it was agreed that a certain share of the profits, if any accrued, should be paid over to Comte. Two years had now elapsed, and the sales had been sufficient to make this

agreement operative: something was due to him. The sum was under twenty pounds I think; and this I willingly undertook to pay over to the philosopher—willingly, of course, for the introduction was a good one, and naturally I was curious to see him.

In my first letter home from Paris, written to my mother on October 20, and giving the address 17 Rue de la Croix, Passy, there is a not very flattering description of him. Certainly his appearance was not in the least impressive, either in figure or face. One could say of his face only that, unattractive though it was, it was strongly marked; and in this way distinguished from the multitudes of meaningless faces one daily sees. Of our conversation I remember only that, hearing of my nervous disorder, he advised me to marry; saying that the sympathetic companionship of a wife would have a curative influence. This, by the way, was a point of agreement between him and one who differed from him in most things—Professor Huxley; who in after years suggested that I should try what he facetiously termed gynœopathy: admitting, however, that the remedy had the serious inconvenience that it could not be left off if it proved unsuitable.

As before, the glitter of Paris soon palled upon me; and, as before, I soon felt the depressing effect of remoteness from friends, made greater by the restless state of mind due, I suppose, to my nervous disorder. These causes soon raised my discontent to moving point. Hence the following passages in a letter to my father.

"Perhaps you will think me whimsical, but I am already getting tired of Paris and am thinking of returning. I find perpetual sight-seeing very fatiguing; and further, I am in great want of society. All the people I know are occupied during the day; and I have seen little or nothing of anyone beyond making calls. The result is that I have difficulty in passing the time.

"A chief reason, however, for my resolution to return is that I have got an idea of a smoke-consuming fire-place which I am anxious to put to the test."

In pursuance of the intention named, I left Paris about a week later, and after staying a week in London returned

home. There I shortly found that, under conditions something like those intended, smoke would not behave as I expected it to do: it "ended in smoke" instead of carbonic acid. The remainder of November and nearly the whole of December were passed at Derby

I suppose this interval at Derby was partly occupied in pondering the question—What must be done? Nearly a year and a half had now passed since I did any work, and I was still far from recovery. Though, as the above given series of extracts from letters show, I was continually expecting to be very soon well, I was continually disappointed. The progress is from time to time reported, but there is evidently not an adequate reporting of the regress. And here let me briefly describe my condition at that time and afterwards.

Appearances gave the impression that I was in fair health. Appetite and digestion were both good; and my bodily strength, seemingly not less than it had been, as tested by walking, was equal to that of most men who lead town lives. This continued to be my state for many years.

Both then and afterwards, my sleeping remained quite abnormal. A night of sound sleep was, and has ever continued to be, unknown to me: my best nights being such as would commonly be called bad ones. Save when leading a rural life with nothing but out-door sports to occupy attention, I probably averaged between four and five hours of unconsciousness. But it was never continuous. The four or five hours were made up of bits; and if one of the bits was two hours long, it was something unusual. Ordinarily my night had from a dozen to a score wakings. Moreover at that time and for five and twenty years after, the sensation of drowsiness was never experienced. I went to sleep unawares; and when I awoke was instantly broad awake.

Along with the state of brain thus implied, there went

that inability to work without presently bringing on abnormal sensations, with which my disorder set in. Neither then, nor at any subsequent time, was there either disinclination or incapacity for thinking or writing. It was simply that continuous application produced this feeling in the head which gave warning that something was going wrong. During these eighteen months above described, this symptom soon came on; and though in after years I could, when at my best, do three hours' work without mischief, I never got beyond this. A disastrous relapse soon followed if I tried to do more.

At that time and always afterwards, reading had the same effect as working; no matter what the nature of the reading. During periods of relapse a column of a newspaper would suffice to put my head wrong; and when at my best I could not, after my morning's work, read even a novel for long without suffering. When I treated myself to one, which happened perhaps once in a year or two, I had to get through it by a dozen instalments. Ordinarily my habit was that of taking up a book or periodical for half or three quarters of an hour in the afternoon. Reading in the evening for that length of time destroyed part of the rest I ordinarily got. The implied cutting off from nearly all literature save that which I could utilize, and from a large part of this, was one of the heaviest of my deprivations.

As indicated in sundry of the above extracts, social excitement habitually proved injurious. Though, afterwards, I was able to bear a moderate amount of it without mischief, yet much animated talk, especially if it verged into discussion, brought on me the penalty of an unusually bad night. Going to a theatre, though sometimes not detrimental, and occasionally even beneficial, frequently did me harm. Music was perhaps the only thing which I could enjoy in full measure with impunity. But one could not always be going to concerts; and good domestic

music was rarely to be had. Of course these various incapacities made it difficult to spend leisure time with any satisfaction. Much of it had to be passed in a state of mere passivity; and the having to live through many vacant hours was injurious in various ways.

But to return from this partially digressive description to the immediate question which pressed upon me—What must be done. Longer entire idleness did not promise much benefit. Moreover, two years and a half had elapsed since my pen had brought me any money. Clearly it was needful to try and do something; and with this conviction I left for London the day after Christmas Day.

CHAPTER XXXIII.

SOME SIGNIFICANT ESSAYS.

1856—7. Æt. 36—37.

During my consultation with him, Dr. Ransom advised me never in future to live alone. He thought, and no doubt rightly thought, that my solitary days in lodgings had been largely instrumental in bringing on the physiological disaster which had already cost me so much of life and of work, and was thereafter to cost me far more. Probably he inferred that in the absence of distractions my brain had been active during times which were nominally times of rest; and he doubtless recognized the truth that besides this positive mischief, there had been the negative mischief which lack of society and its enlivenments entails.

I willingly yielded to his suggestion; and, on arriving in town at the close of December, 1856, took steps to find a family with which to reside. My requirements were fairly well met at No. 7, Marlborough Gardens, St. John's Wood, then occupied by a solicitor, whose business, as I gathered, had been ruined by his negligence, and whose wife was endeavouring to eke out their diminished means by taking an inmate. Ordinarily the presence of children is regarded by one who wishes accommodation of this kind as an objection; but it was not so by me. As I was at an age when, in the normal order of things, I should have had a growing-up family of my own, there was, I suppose, some natural desire to be surrounded by boys and girls—or rather, I should say, by girls. Perhaps actual paternity would

have changed my feelings in the matter; but otherwise I fear the daughters would have come in for undue shares of affection. Here, two little girls of five and seven were just fitted to serve as vicarious objects of the philoprogenitive instinct; and, with the rest of the circle, supplied that liveliness of which I was in search in a greater degree than a party of adults would have done.

I may remark in passing that I take some little time to establish friendly relations with children; because, in the treatment of them, I ever feel inclined to respect their individualities. Very commonly strangers begin to caress them forthwith without considering whether they may or may not like to have liberties taken. Children often rebel internally, if not externally, against this disregard of their dignity; and, where they are allowed full freedom, and themselves left to make the advances, they sometimes show preferences for those who so treat them.

The family afforded facilities for observations and experiments which afterwards proved useful when treating of education. Surprise has not unfrequently been expressed to me that, being a bachelor, I should have interested myself in questions concerning the management of children, and should have written on them with some success. But in common with most bachelors, I had various opportunities of watching children, and watching the conduct adopted towards them, and watching also the effects. The remark that bystanders often see most of the game, is applicable to domestic life as to many other things. Though it is true that actual members of the domestic circle must have experiences the outsider cannot have, yet the outsider's views have their value, and are indeed almost indispensable. Being free from the emotions of parenthood, and in many cases thereby incapacitated for judging, he is in other cases enabled to judge more fairly.

Among the advantages of the house was that it stood within five minutes' walk of Huxley's house; and one of the

remembrances connected with my return to town, is that I was in time to join a New Year's Day dinner Huxley gave. I name the fact, because it was the first of a long series of such dinners at which I had the pleasure of being a guest. For more than twenty years I failed to be present but once only: being on that occasion detained at Derby. In later years ill-health sometimes, and at other times absence abroad, broke the custom.

Of course the first thing to be done in the way of work, was to fulfil the engagement made in the autumn of 1854, to write for the *Westminster* the article on "Progress: its Law and Cause." Suspended for more than two years, this undertaking had, I suppose, been the subject of thought in the interval; and, I suppose, also the subject of some anxiety. Regarding the generalization I wished to set forth as important, I must have been occasionally irritated by my prolonged inability. Still, I was it seems content to let the months slip by without making any effort; and so far as I can remember was without any great feeling of restlessness. Dr. Ransom, indeed, urged me not to worry myself about loss of time; but I suspect that this advice would have weighed but little with one who was constitutionally more energetic.

January, February and two-thirds of March were occupied in preparing the article. Writing home on February 4th, I remark—"On the average I get on with my MS. at the rate of about a closely written page of post-paper per day, which takes me from two to three hours; and though it usually congests my head more or less before I have got half through, I do not find I permanently suffer." I succeeded, but only just succeeded, in completing the MS. in time; and I remember that my face bore clear traces of the strain. As the essay occupies but 41 pages, giving an average of some half-page per day, it may be imagined what was still my state after eighteen months' rest. How-

ever, no mischief was done. Contrariwise, the effort proved beneficial.

Of the article itself, which formed the initial instalment of the *Synthetic Philosophy*, I may remark that its title shows the side from which the generalizations set forth in it had been approached. The use of the word "progress" implies that its originating thought concerned human affairs and human nature; for the ordinary connotations of the word refer almost exclusively to man and his doings. The doctrine had been at the outset anthropocentric. Such vague foreshadowings of it as occurred in *The Proper Sphere of Government* and in *Social Statics*, were obviously of this character. Though in "The Development Hypothesis" there was shown the presence of a conception not directly relevant to human progress; yet in the subsequent essays "A Theory of Population," "The Art of Education," "The Genesis of Science," &c., the idea of progress shows itself chiefly in relation to humanity and its products: being recognized, however, as not restricted to these. And then in the *Principles of Psychology*, while mental development is treated of as exhibited throughout the animal kingdom at large; yet the obvious purpose of the general survey made, is to find a key to the mental development of man. Doubtless the implied belief that mental progress in man is part of a general mental progress, tended to subordinate the anthropocentric view. Nevertheless, as I have said, this essay on "Progress: its Law and Cause" betrayed by its title the course of its genesis. Though it began by pointing out that the word progress is commonly used in too narrow a sense; yet the fact that I continued to use the word shows that I had not then recognized the need for a word which has no teleological implications.

On reconsidering the general ideas set forth in the article, I am struck by the fact that there failed to appear among them certain general ideas previously reached, and

which should, in their developed forms, have occupied important positions. Already in the essays on the "Genesis of Science" and the "Art of Education," as well as in the *Principles of Psychology*, increase of definiteness had been recognized as a characteristic of advancing development; and already, in each of these, there had also been recognized as characterizing one or other kind of development, a growing integration. Yet in this essay on "Progress: its Law and Cause," there is no recognition of these traits as holding of things in general. The sole trait of progress alleged and illustrated throughout all its stages, is the transition from the homogeneous to the heterogeneous; and the sole cause assigned is the multiplication of effects. Traits which had been previously alleged as accompanying this transition in sundry particular classes of phenomena, seem to have dropped out of sight. Only at subsequent periods were they re-recognized and presented in their places as characters of the universal transformation.

Something should be said concerning the way in which the genesis of organic forms is interpreted. In the first or inductive part, multiplication of the varieties of them throughout geologic time, is one of the assigned illustrations of the change from homogeneity to heterogeneity. In the second or deductive part, this change, in common with all the other changes instanced, is interpreted as consequent on the multiplication of effects. Every species is represented as continually forced, alike by its normal multiplication and by occasional geologic or climatic alterations in its habitat, to spread into other habitats—not in one direction only, but in many directions: the result being to produce numerous divergences and re-divergences of structures, and occasionally higher structures. But while in this view there was nothing incongruous with views since enunciated—while the old conception that successively higher organic beings form a series or chain was tacitly repudiated, and there was tacitly implied the

conception of perpetual branching and re-branching of species; yet the causation indicated was inadequate. At that time I ascribed all modifications to direct adaptation to changing conditions; and was unconscious that in the absence of that indirect adaptation effected by the natural selection of favourable variations, the explanation left the larger part of the facts unaccounted for.

The article drew some attention: not, of course, from the reading world in general, but from a scattered few of the more thoughtful. Little comment, however, was made; and that which was made was not particularly helpful. The only remark I now recall was that the second half of the article, which had for its purpose to give a *rationale* of the universal change described in the first part, was not of much value: the implication being that the induction might properly remain without any search for a deductive interpretation of it. Happening to know, as I did, that the criticism came from a University man specially distinguished in formal logic, I was struck with the strangeness of his implied belief that the empirical stage of a generalization may be contentedly accepted as its final stage.

"Now we have got to the top and shall have a view all round," is often the remark accompanying the last few steps when ascending an eminence. And then, notwithstanding past experiences, there is a feeling of surprise on discovering further on a more elevated peak previously hidden. Such incidents are recalled to me by repeated similar mistakes in mental ascents. With the completion of the article on "Progress: its Law and Cause," I supposed that no further height had to be reached; but very shortly the lifting of the mist disclosed near at hand a point considerably above that on which I was resting. A survey all round made it manifest that there was another general cause for the change from homogeneity to heterogeneity—a cause which, in order of time, takes precedence

of the multiplication of effects. This further conclusion must have been promptly reached; since the article enunciating it was written in the interval between the beginning of April and the latter part of June.

There then existed, and had existed for some years before, a quarterly called the *National Review*. It had been established by adherents of the Rev. James Martineau in opposition to the *Westminster Review*, which had ceased to be adequately representative of their views. The editors of this new quarterly were Mr. Walter Bagehot and Mr. R. H. Hutton. I offered, and Mr. Hutton accepted, an article embodying, along with some less important generalizations, the generalization just indicated.

I proposed for it the title "Transcendental Physiology:" wishing to imply that it was concerned with those physiological truths which, not taking note of divisions among species, genera, orders, classes, or even kingdoms, hold of all organisms—truths of which the familiar one that like produces like, may be taken as typical. One section had for its purpose to show that with advance in the forms of life there is an increasing differentiation of them from their environments. There was also set forth the general truth that with the differentiations which become increasingly marked during the developments of individual organisms, there simultaneously go on integrations, which it was contended should be recognized as part of the developmental process. But the leading conception which the essay contained, was the above-indicated further cause of progress—the instability of the homogeneous. This was dwelt upon as being, like the multiplication of effects, a principle holding not among organic phenomena only, but among inorganic and super-organic phenomena. And with this further step I erroneously supposed that the interpretation of progress was complete. I say progress, but I ought to say evolution; for now the word is introduced and begins to be used in place of progress. The only

further fact of significance is that I recurred to the analogy recognized in *Social Statics*, between individual organisms and social organisms; and that, especially in connexion with the process of integration exemplified in both, urged that comparisons between the two sets of phenomena should be made with a view to mutual elucidations.

The article was issued in the October number of the *National Review* under the title of "The Ultimate Laws of Physiology," which I adopted in deference to editorial wishes: restoring the original title, however, when the essay was republished along with others in a permanent form.

My life at this time was somewhat monotonous. A letter to my mother of March 31st, however, shows that a few distractions occurred.

"I called on John Mill a short time ago. We had a long chat. He was very friendly and asked me to call again. [This was the first time I saw Mill. The call was prompted by the receipt, while in Scotland during the previous autumn, of a copy of the new edition of his *Logic*, in which he had replied to my criticism upon him.]

"I dined lately at Mr. Charles Buxton's and met there Greg, Huxley, and Sir Henry Holland. I see Mr. Buxton is since elected M.P. for Newport. I am glad of it. He is a genuine and sensible man.

"The Smiths have taken a beautiful house at Richmond for the spring. I spent a Sunday with them a few weeks ago; and am to go down again on Saturday next to stay over Sunday. They are delightful friends.

"At the suggestion of Lewes I have been distributing about thirty copies of the 'Princ. of Psy.' among the leading men of science and philosophy."

Doubtless Lewes had made this suggestion on learning from me that there was very little sale of the *Psychology*, and on thinking that some use might be made of it by distribution if not otherwise.

How did I pass my leisure hours? In those days I was not a member of a club; and now that I have been for many years habituated to one, I am at a loss to understand what I did in the latter part of the day. Then, as always after my nervous breakdown, reading, even of the lightest kind, told upon my brain just as much as working. So

far as I can remember, a walk into town, half-an-hour at a public news-room, and a walk back, served to fill part of the afternoon; and the rest was spent in such miscellaneous ways of killing time as might offer themselves.

Mention of these returns from town in the afternoon, reminds me that I sometimes called at the Museum in Jermyn Street at the hour when Huxley usually left, that we might walk back together. Involved as the hypothesis of organic evolution was in most of my thinking, it not unfrequently cropped up in our talk, and led to animated discussions in which, having a knowledge of the facts immensely greater than mine, he habitually demolished now this and now that argument which I used. But though continually knocked down, I continually got up again. The principle which he acted upon was that of keeping judgment in suspense in the absence of adequate evidence. But acknowledging, though I did, the propriety of his course, I found myself in this case unable to adopt it. There were, as it seemed to me, but two imaginable possibilities—special creation and progressive development; and since the doctrine of special creation, unsupported by evidence, was also intrinsically incredible, because incongruous with all we know of the order of Nature, the doctrine of development was accepted by me as the only alternative. Hence, fallacious as proved this or the other special reason assigned in support of it, my belief in it perpetually revived.

Returning from this digression to the account of my daily routine, I have to add that the evening usually brought whist, into which I was initiated by my hosts. Up to that time I had never played any game of cards. Neither then nor after did I become a tolerable player. I have not a memory of the required kind. To me it has ever been a marvel that after a hand people should be able to remember all that has been done.

My stay in town came to an end somewhat prematurely.

Disappointed in their hopes of adequately adding to a failing income, my hosts were obliged to give up the house. The result was that I had to remove before midsummer. After a short time at home I started for a fishing expedition to the north.

Fishing had proved so good a sedative, by uniting moderate exercise with pleasurable occupation of mind, that it became then and afterwards a deliberately chosen pursuit; and one to which, indeed, it would have been well had I devoted myself more frequently and for longer intervals than I did. The western lowlands held out temptations. There was the river Ken, said to contain salmon; and there were lochs, to the owner of some of which I had an introduction. Rail to Dumfries, coach to Castle Douglas (for there was then no railway) and on foot to Dalry brought me to the ground. The excursion was planned as a pedestrian one, with no *impedimenta* but rod and fishing basket, and such small selection of needful things as the fishing basket would contain. I had a great dislike to the annoyances entailed by baggage; and it was always with some feeling of elation that I cut myself free from everything but what I could carry about me. Like children, portmanteaus and trunks are hostages to fortune. For many years I tended, not only when moving but when stationary, to minimize my belongings as much as possible: my love of freedom showing itself, among other ways, in aversion to that passive tyranny which material possessions exercise over one. I wonder how I should have tolerated travelling with a wife's half-dozen boxes to look after!

"'Tis distance lends" sport to the river, as well as "enchantment to the view." Wherever the rumour of good angling takes one, the habitual experience is that, not just there but a little further away, is the great success to be had. So it proved with the Ken at Dalry; and after a few days I gave up hope from it. An expedition in search of something better to a loch in the neighbourhood, was followed by an experience characteristic of the locality.

On returning to Dalry after a night's absence, I found the place alive with people brought together by what proved to be an annual hiring fair. On entering the inn I had been staying at, I found all the rooms below crowded with men smoking and drinking; and after looking in vain for some quiet place, decided to take refuge in my bedroom. To my dismay, on going upstairs, I found my bedroom also full of men smoking and drinking. Had I been prone to study human nature in the concrete as well as in the abstract, I might have utilized the occasion. But a retreat and a protest below stairs came much more naturally to me: the result being eventually advantageous, for they found me comfortable accommodation in an adjacent house.

A week or so was passed at Andarroch, a farmhouse a few miles to the north of Dalry, and a short distance from the banks of the river. Spending leisure time, now in rambling over the moors, now in trying with one or other lure to tempt some salmon which were lying below the falls of the Ken, I spent the mornings in writing part of the essay on the "Origin and Function of Music." I forgot to say that before leaving town, an engagement for this essay had been made with the editor of *Fraser's Magazine*. As usual, the leading thought was evolutionary. The inquiry which had arisen in my mind was—How has music naturally originated? An obvious corollary from the doctrine set forth in the *Principles of Psychology*, was that the musical faculty, in common with all faculties, must have arisen by degrees through complications of pre-existing elements in human nature. Clearly music excites one or other emotion, and does this because it expresses one or other emotion. How comes it to express one or other emotion? Feeling of every kind, sensational or emotional, tends to discharge itself in muscular contractions. Among muscular contractions produced by the discharge are those which strain the vocal organs. Emotion consequently expresses itself not only in visible movements, but in sounds: the one, like the other,

being violent in proportion as the emotion is strong. Not in loudness only, but in pitch and in *timbre* do the sounds emitted vary with the kind and intensity of the emotion; and not in these respects only, but also in the range of tones which the emotion produces, as also in the rapidity with which the tones succeed one another. Here, then, were certain physio-psychological phenomena which evidently in sundry ways linked the natural expression of emotion with musical expression. Added to which there was the familiar fact that the cadences used in ordinary speech are expressive of feeling, and vary as feelings vary. Hence came the question—Is not music a development of this natural language of the emotions? The article aimed to show in detail that it is.

How strong becomes the craving for companionship after a period of solitude! Before leaving Derby I had persuaded my artist-friend Deacon to join me in Scotland; and after a fortnight, during which I held speech with none save strangers (and I am a long time in breaking the ice with strangers), I got very impatient for his arrival—so impatient, that I walked some ten miles to the railway-station at Minnihive to meet him at the appointed time. He disappointed me, however; and after having at Minnihive an experience like that above described, consequent upon a hiring fair, I had next day to walk back disconsolately alone. When a few days after my friend joined me, we made our way across country to Beoch on Loch Doon—my abode for a week the year before. There, now in rambling, now in fishing, now in writing, a pleasant fortnight was passed: talking to the old farmer and his wife being occasionally among the distractions. For me, and I suspect for most southrons, a small amount of conversation with those who talk broad Scotch suffices; since the degree of attention required to follow speech much divergent from one's own in its words and pronunciation, soon becomes fatiguing. How entirely relative to the desires and to the

mental state is the idea of beauty, was, I remember, interestingly shown on some of these occasions. Enlarging, as Beoch did (he was sometimes called by the name of the place), on the beauty of England, into which he had once made a journey, he meant, I found on inquiry, the beauty of its rich pastures and fine fields of corn; and to him the barrenness of the adjacent hills and moors was equivalent to ugliness. So little interest was felt in the picturesque, that to my surprise I found the wife, although she had lived there twenty years, had never been to the top of an adjacent hill some 1,000 feet high, which I climbed within a few days of our arrival. If there exists among mountain-bred peoples that strong love of home which is alleged of the Swiss (though considering how much they have had to expatriate themselves, it may simply be that the occasions for displaying home-sickness have been more frequent among them), it is probably less because they love the beauties of their land than because its multitudinous striking features afford holds for early associations which cannot arise in a flat country, where every locality is like every other.

The improvement in health achieved during the season in London, was increased in Scotland by the fresh air, exercise, fishing, and—I was going to say—quiet. But I am arrested by the remembrance that to nervous subjects country places often prove the reverse of quiet. The early chirping of sparrows and, still worse, the clucking and crowing of fowls, are dreadful inflictions to them. I have often entertained sanguinary feelings towards a vociferous cock, which, after I had passed the first part of the night in tossing from side to side, began crowing just as I was beginning to get a little sleep, and kept me awake during the ensuing hours. At Beoch a droll incident was associated with this experience. My bedroom faced the farmyard, and to get sufficient air in a small room I had to keep the window partially open. The result was that the

early crowing of the cock was a great torment to me. To remedy the evil, the good people shut up the cock in a barn on the opposite side of the yard. But as the bottom of the barn-door was worn away and the pavement hollow, the space sufficed both for the light of the dawn to advertize the cock that it was time to begin crowing, and to allow the sound to be heard almost as clearly as before. The device they then hit upon, which proved quite effectual, was to place him under an inverted bucket, and there keep him until I was getting up. It was amusing to observe how, when released, he endeavoured to make up for lost time by crowing with immense energy and rapidity.

The appetite for fishing having been pretty well satisfied, my article finished, and Deacon's vacation nearly ended, we turned our faces southward and travelled together as far as Penrith. Not having seen anything of the English lakes, I there left him and made a *détour:* walking to Ulswater and along its banks to Patterdale; next afternoon ascending the Kirkstone Pass, and getting so drenched that I had to stop at the little inn at the top, which boasts itself as the highest inhabited house in England; descending thence to Windermere and by railway to Derby.

I have omitted to name an engagement which was made before I left London in the early summer. A letter to my father, written apparently in May, contains the following passage:—

"I have agreed to write another article for the Westminster in October on the meddling system. I think of entitling it—"Representative Government: what is it good for?" the aim being to show that it is specially fit for administering justice and specially unfit for anything else."

This article I commenced on my return home from Scotland, and completed it during a visit I paid to my friends at Standish in September.

I may remark of it that, in addition to the political aspect indicated in the above extract, it has aspects of a

more general kind. Beyond a further development of the doctrine of limitation of duties, and a further bringing to bear of biological truths on Sociology, there was involved in it the general theory of evolution in so far as it implies that specialization of structures in adaptation to special functions, is an advance in organization. Unfortunately the resulting conceptions were then, as they are now, "caviare to the general." That inferences drawn from the laws of organization have a practical bearing on politics, seemed thirty years ago, as it seems at present, an absurd fancy. There still continues the tacitly-implied belief, alike among statesmen and people, that there are no laws of organization. The conception of natural law, which does not exist in the savage, is as yet but rudimentary in the civilized.

Leaving Standish towards the close of September, and spending on my way a few days in town, where nothing tempted me then to settle down for the winter, I went on to Brighton.

I had for some time contemplated a republication of the various essays I had written for quarterly reviews and other periodicals. Not being essays in criticism, or discussions of passing topics, or papers written for those who seek to kill a vacant hour, but being the vehicles of ideas which, as it seemed to me, were of permanent value, and on the elaboration of which I had spent much trouble, I, from the outset, looked forward to a time when they would be gathered together and issued in the form of a volume. They had now become sufficiently numerous; and while at Brighton I prepared them for republication. The preparation consisted not in any modifications of substance, either by additions or subtractions or alterations; but simply in improvements of expression. Whether or not I inherit the liking for revision from my father, who was

much given to correcting both his own writing and that of others, I do not know. But all through my life I have had a pleasure in doing that which to many authors gives pain. Matter which has been revised in manuscript, and again revised in proof, always presents itself to me as needing revision when I have decided to republish it; and even on a second republication the need to go carefully through it again is peremptory with me. When revising print, or even re-revising it, the sight of a page on which there does not occur a sprinkling of erasures and marginal alterations, gives me a vague feeling that I have not done my duty by it; and not unfrequently I go over it again to see whether anywhere a briefer expression can be substituted or a superfluous word omitted. It is surprising how difficult it is to write in succession any considerable number of sentences which are in all respects proof against criticism—surprising, too, to discover, after the lapse of years, how many imperfections had been on previous occasions overlooked.

One of the Members of Parliament for Brighton in those days, Mr. Conyngham, was an acquaintance of mine; and when I one day called upon him, he suggested that I should accompany him to call on Buckle (recently made famous by the first volume of his *History of Civilization in England*), who had taken a house in Sussex Square for the autumn. On being introduced to Buckle, I was a little startled to see a face and head not unfamiliar to me. Presently I remembered that I had often seen him at the cigar-divan in the Strand, some ten years before, at a time when I frequently spent the Sunday evening there. He was a chess-player of note; and in those days the cigar-divan was one of the chief places of meeting for men given to chess. He must have become bald very early; for the absence of hair, pretty much as marked in 1846 as in 1857, was one of the traits by which I remembered him. I cannot recall anything that passed; but existing between us as there did,

some sympathy of feeling, though not much community of idea, the introduction initiated an acquaintanceship.

Towards the close of October or beginning of November, I had completed all the work that was practicable at Brighton, and went back to London.

APPENDICES

TO

VOL. I.

APPENDIX A.

SKEW ARCHES.

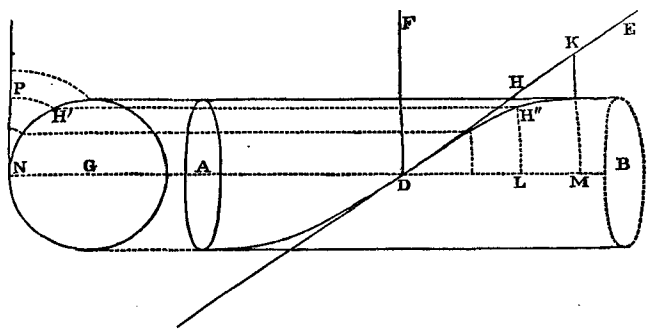
[*From the "Civil Engineer and Architect's Journal" for May*, 1839.]

Sir,—The usual method of obtaining the spiral courses, in drawings of skew arches, is productive of much labour.

I have been led to believe that the following plan is much simpler, more expeditious, and consequently easier of comprehension; and although the same idea may possibly have occurred to others, it may not be so generally known as to be entirely unacceptable.

A spiral is defined as being a line traced upon the surface of a cylinder, by the extremity of a revolving radius, which radius has also a uniform motion along the axis.

FIG. 1.



Let AB, fig. 1, be a cylinder, and DE any line making an acute angle with the axis, it is evident that the line DE, is the locus of a point having a uniform motion, in each of the directions DB, DF, and if the line DE be wrapped round the cylinder, it will still possess the same property, only that the motion in the direction DF, will be transformed to a motion round the cylinder, and the line will thus become a spiral.

I have said this in order to show, as clearly as possible, that a straight line, when wrapped round a cylinder, produces a curve conforming to the definition of a true spiral, and will now proceed to explain the simplest method I have found of projecting this curve.

If a piece of paper, having a straight edge, represented by the line DE, be rolled round a cylinder, it will be found that all the points H, K, &c., will approach the cylinder, in vertical planes perpendicular to the axis, the edges of which planes are represented by the lines LH, MK.

Hence it will be seen, that to ascertain the position of any point H, when the line DE is wrapped round the cylinder, we have only to wrap round the line LH; this may easily be done by drawing an end view G, of the cylinder, and taking NP equal to LH, finding NH' the length of the curve equal to NP,* and projecting the point H' to H'', we obtain the position that H will occupy upon the cylinder. In the same manner all the points in the curve may be found.

We now come to the practical application.

FIG. 2.

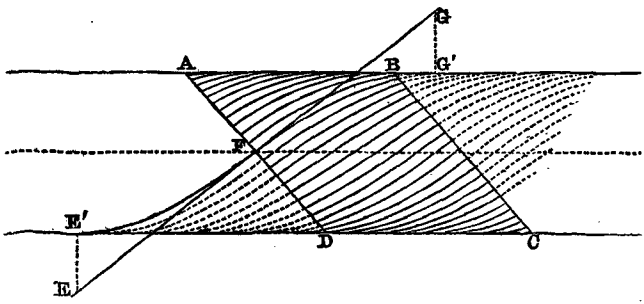


Fig. 2.—Let ABCD denote the outlines of the plan of the soffit of a skew arch, and let EFG be drawn making the proper angle† with the face.

Then by the plan I have just described, the line EG may be wrapped round the cylinder, and E' FG' the curve generated, will represent one of the spiral courses. Now each of the courses of a skew arch would, if produced, wrap itself round the cylinder, and present a curve similar to E' FG', hence every one of the courses of the arch will be a portion of this curve;

* This may be done by calculation, but measurement by compasses is near enough for practical purposes.

† This line would be at right angles to the face, on the surface halfway between the soffit and crown. (See Mr. Fox's pamphlet on Skew Arches.)

if, then, a mould be cut to the curve E′ FG′, it is evident that by setting on the proper distances, along the lines AG′ E′C, and applying the mould to the corresponding points, all the courses may be drawn, as shown on the figure, with little trouble.

I believe the common practice is to project each of these joints on the soffit separately; where the arch is brick, and each course shown, this is a work of much labour.

The same principle, with a little modification, is applicable to the other views of the arch, more particularly to the outline of the developement of the soffit, only that in this case the operation is unrolling instead of rolling the line.

In case any may not understand the preceding explanations, I would recommend those who feel interested in the matter to try the experiments with the paper and wooden roller, and they will quickly perceive the principle.

B. & G. Railway-office,
Worcester.

Yours obediently,
H. SPENCER.

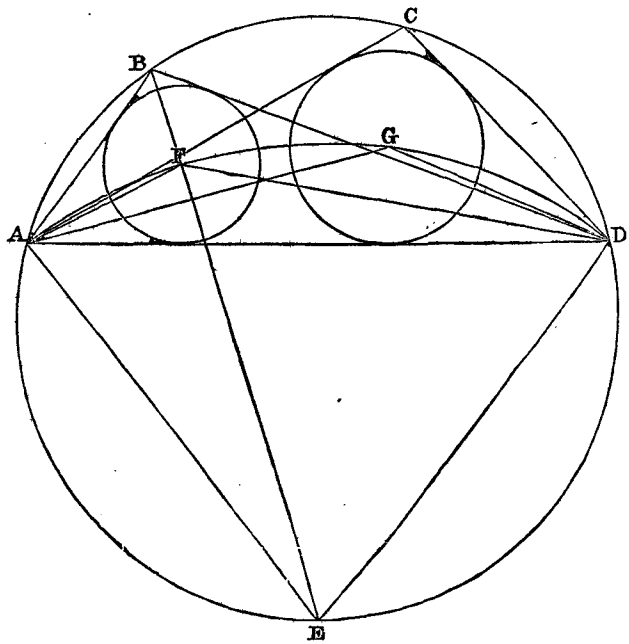
APPENDIX B.

GEOMETRICAL THEOREM.

[*From the "Civil Engineer and Architect's Journal" for July*, 1840.]

SIR,—I believe that the following curious property of a circle has not hitherto been noticed; or if it has, I am not aware of its existence in any of our works on Geometry.

Let ABCDE be a circle, of which ACD is any given segment: Let any number of triangles ABD, ACD, &c., be drawn in this segment, and let circles be inscribed in these



triangles: their centres F, G, &c. are in the arc of a circle, whose centre is at E, the middle of the arc of the opposite segment AED.

DEMONSTRATION.

Join AF, FD, AG, GD; then since F is the centre of the circle, inscribed in the triangle ABD, the lines AF, FD, bisect the angles BAD, BDA. (Euc. B. 4, P. 4). For a like reason AG, GD, bisect the angles CAD, CDA; hence the angles FAD, FDA, together, are equal to half the angles, BAD, BDA together, and the angles GAD, GDA together, to half the angles CAD, CDA together. Now the angles ABD, ACD, are equal (being in the same segment), therefore the angles BAD, BDA together, are equal to the angles CAD, CDA together, and as the halves of equals are equal, the angles FAD, FDA together are equal to the angles GAD, GDA together; that is in the two triangles AFD, AGD, two angles of the one, are together equal to two angles of the other, and therefore the third angle AFD, is equal to the third angle AGD. The same reasoning will prove, that all angles similarly circumstanced to AFD, are also equal to AGD: therefore, the points A, F, G, D, are in an arc of a circle.

Join BF, and produce it to cut the opposite circumference in E and join EA, ED; then because the angle ABE, is equal to the angle DBE, the segment AE, is equal to the segment ED, and the chord AE, to the chord ED. Again the angles ABE, EDA, are equal (being in the same segment), and by construction, the angle ADF is equal to the angle FDB, therefore the whole angle EDF, is equal to the two ABF, FDB, that is to the two FBD, FDB, that is to the exterior angle EFD; therefore the angle EFD, is equal to the angle EDF; consequently EF, is equal to ED, that is to EA. The same reasoning would prove EF to be equal to a line drawn from G, to the point E. Wherefore the point E is the centre of a circle, of which F and G, as also the centres of all other circles similarly inscribed, are in the circumference.

H. SPENCER.

Birmingham and Gloucester Railway Office,
Worcester.

APPENDIX C.

VELOCIMETER.

AN INSTRUMENT FOR CALCULATING VELOCITIES ON RAILWAYS, &c.

[*From the "Civil Engineer and Architect's Journal" for July*, 1842.]

The instrument represented in the annexed plate, which I have named a "Velocimeter," is intended to supersede the long calculations, frequently necessary, in obtaining velocities in engine trials.

When the times of passing the quarter mile posts only are noted, such an apparatus is hardly called for, since, the distances being constant, a table may readily be made out which will give the velocities due to the different times; but it is a common practice, and perhaps a more satisfactory one, to note the times taken in traversing the several gradients, where the distances as well as the times are variable. The lengths of the inclines are generally fractional, and probably no two are the same, and none of the times of travelling over them are equal; consequently each case involves a distinct calculation, and where the trials have been extensive, several days may be occupied in making these reductions. It is, therefore, a desideratum to have some other means of obtaining the velocities, than that afforded by the ordinary methods of calculation.

The instrument devised for this purpose, is another application of that very important geometrical principle—the equality of the ratios of the sides of similar triangles. In the right angled triangle ABC (fig. 1), let AB be taken to represent any given number of minutes and seconds, and AC the number of miles and chains passed over in that time. Then, if AB be produced until it becomes equivalent to an hour, and from its extremity D, a perpendicular be drawn intersecting AC produced in E, AE will represent the number of miles that would have been traversed in the hour had the motion been continued, that is, it will indicate the rate per hour at which the distance AC was travelled. Now, if AE be made to revolve round A, and to take any other positions, as AE′ or AE″, it is clear that the relations will still be the same, and that if any distances AC′, or AC″, be described in the time AB, AE′ and AE″ will indicate the respective rates per hour. If, in addition to this,

BC be made moveable along AD, or, what is the same thing, if AD be divided into minutes and seconds, and lines be drawn from the divisions parallel to BC, we shall be able to adjust the revolving line, to any distances and times, within the limits that may be allowed by the arrangement.

It will probably be objected, that if the line AD, representing an hour, is to be divided into minutes and seconds, its length must be so great as to make the instrument too unwieldy for common use. This difficulty is, however, very readily surmounted.

If AD (fig. 2) be taken to represent a quarter of an hour, instead of an hour as in the last figure, it follows, that other things being the same, AE will represent one-fourth of the number of miles per hour; that is, if AE had four times the number of divisions, it would indicate the rate per hour; if, therefore, AE have two scales, one for adjustment and the other with divisions one-fourth the size for indication, the velocities may be read off as before. Or if it be desirable to make use of one-tenth of an hour, instead of one-fourth, we have only to make the indicating divisions one-tenth of the size of the adjusting divisions, and the same result will follow.

In the application of this principle to practice, the following arrangements are made:—AD is the scale of time, embracing in this case one-tenth of an hour, or six minutes; each minute includes 15 divisions, one of which will, therefore, represent 4 seconds, and as each of these may be readily bisected by the eye, the scale may be considered as divided into periods of two seconds each. AE is the scale of distance, turning on the centre A, the adjusting scale being divided into 4 miles, and each of these subdivided into 80 chains; the same space is divided on the indicating scale into 40 miles, and each of these into eighths, ten miles on the one scale being equivalent to one on the other, in consequence of the time scale extending only to one-tenth of an hour.

To obtain results by this apparatus, the revolving scale is moved until the division answering to the number of miles and chains passed over, is made to coincide with the division, representing the number of minutes and seconds, occupied in the transit; and this adjustment being made, the rate per hour is read off on the indicating scale, at its point of intersection with the line DB. For instance, a gradient 1 mile 25 chains long, is traversed in 2 minutes 48 seconds; what is the velocity? The divisions corresponding to these data being made to coincide, as shown at (*a*), the point of intersection on the indicating scale is examined, and the velocity found to be rather more than 28 miles per hour, which is the result given by calculation.

Again, a locomotive travels 1 mile 54 chains, in 4 minutes

40 seconds: required, the rate per hour. The revolving scale is moved as before, until the distance division 1 mile 54 chains at (b), is brought to (b') on the division of 4 miles 40 seconds; the edge of the scale will then occupy the line A c', and the point (c) on the scale will have arrived at the point of intersection (c'), showing the velocity to be rather more than 21½ miles per hour.

Of the three data time, distance, and velocity, any two being given, the third may be found, so that the apparatus may be employed in finding times, and distances, as well as velocities. Thus, having fixed the velocity at which the trains on a railway are to travel, and knowing the distances between the stations, the times of arrival may be ascertained, by adjusting the revolving scale to the required velocity, and noting the times corresponding to the given distances, and should the results be unsuitable, other velocities may be assumed, until the desired ends are fulfilled.

I have constructed two of these instruments, one for small, and the other for greater distances. The first (as far as I can remember, for it is not now in my possession), is about half as large again as the accompanying drawing, and has the same arrangement, except that the indicating scale extends to 45, instead of 40 miles, and the time scale has double the number of divisions, so that differences of a second are appreciable. The other has a time scale extending to 15 minutes, each minute being subdivided into periods of 4 seconds, so that differences in time of 2 seconds are available. The scale of distance has the adjusting scale divided into 11¼ miles, and each mile is subdivided into distances of 2 chains; the indicating scale extends to 45 miles, and each mile is divided into tenths. In both cases, the subdivisions of the time scale are made by lines of different colours, so as to avoid confusion.

These instruments, although made of Bristol board, and having a needle for the pivot of the revolving scale, gave results within one-eighth of a mile per hour of the truth; an approximation quite near enough for ordinary purposes. They were used for some time in engine trials, on the Birmingham and Gloucester Railway, and were found to answer very satisfactorily.

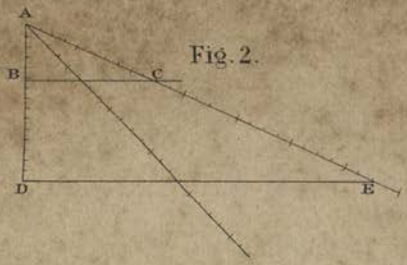
HERBERT SPENCER.

Derby, May 13, 1842.

g. I.

E
E

Fig. 2.


A
B
C
D
E

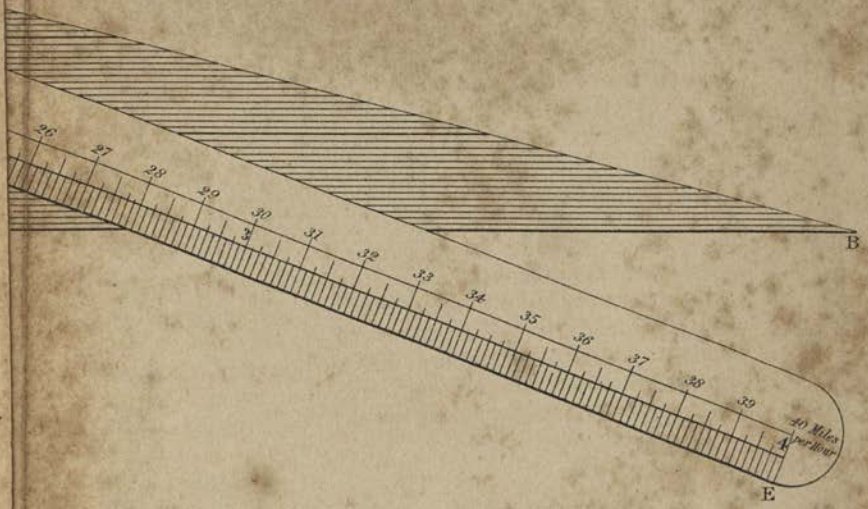
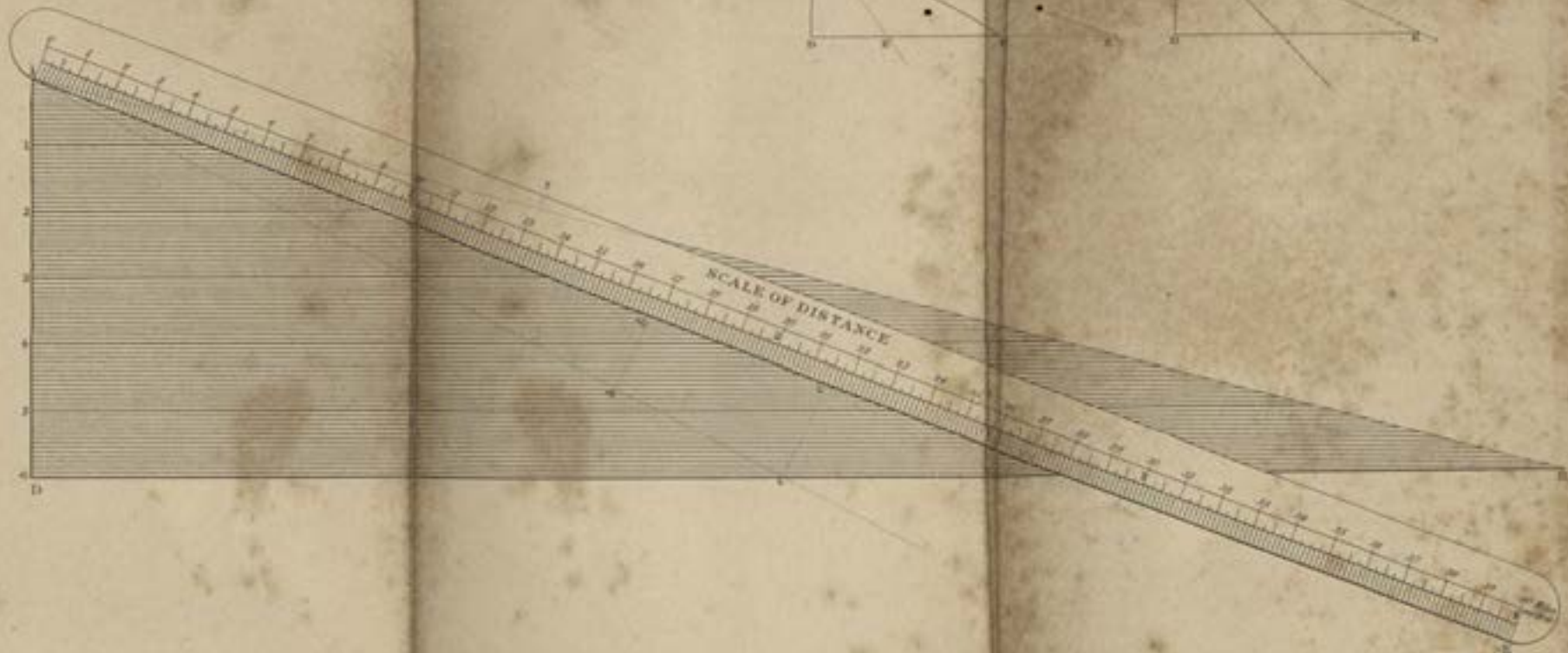

26
27
28
29
30
31
32
33
34
35
36
37
38
39
40 Miles per Hour
4
B
E

Fig. 1.

Fig. 2.



VELOCIMETER

FOR

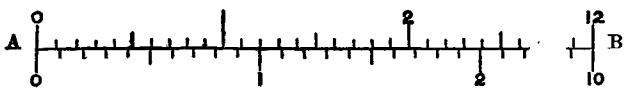
SMALL DISTANCES.

APPENDIX D.

SCALE OF EQUIVALENTS.

[*Devised and made in* 1841, *but not published.*]

Having occasion between two and three years since [this was written about 1842] to reduce a long list of distances given in inches and tenths into decimals of feet, it occurred to me that by making use of a geometrical representation of the relative values of the component parts I might be able to read off the results without the aid of any calculation. The method adopted was this. A line, AB, being taken to represent a foot was divided on the one side into 120 divisions representing



tenths of inches and on the other into 100 divisions representing decimals of a foot; and the divisions having been numbered as usual, for convenience of reading, the equivalent of each dimension given in inches and tenths was read off on the other side of the scale in the new denomination. The same method was evidently applicable to superficial and solid quantity as well as to linear, and to weights and values as well as to quantities.

On reconsidering the subject some time afterwards, it occurred to me that an apparatus might be made which would be universally applicable to the reduction of quantities, weights, values, &c., in the manner above exemplified. The accompanying plate represents, in a completed form but of half the size, the instrument which I constructed for this purpose. AB is a line divided into equal parts; AC a line drawn at right angles to it; and C a point taken in AC to which convergent lines are drawn from the divisions in AB: the lines beyond BC being drawn to divisions in AB produced, but subsequently cut off.

It follows from a simple geometrical principle that any line drawn parallel to AB, and cutting the converging lines, is divided by them into equal parts; and that, consequently, a line may be moved along parallel to AB, until there is found a

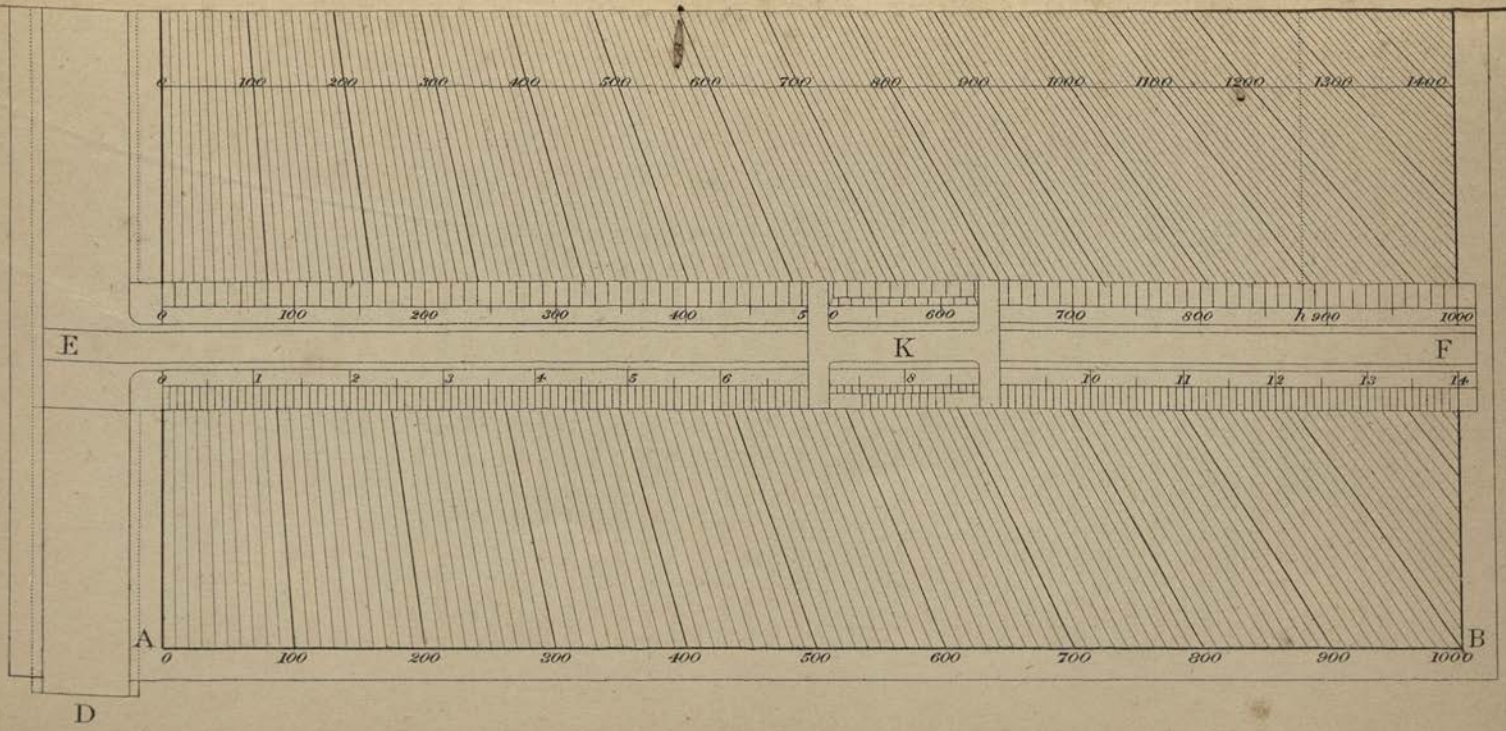
place at which it is divided into a desired number of equal parts: supposing that such number falls within the limits of the scale. This fact is taken advantage of thus. A moveable scale, EF, is kept parallel to the line AB, by an arm MD, sliding in a dovetailed groove, shown in section at G. This scale is divided into such number of equal divisions as may be thought most generally useful: one edge being divided decimally and the other duodecimally; or in a different way if required for some special purpose. Of course, the divisions must be in any case so arranged that the zero of the scale may coincide with the line AC.

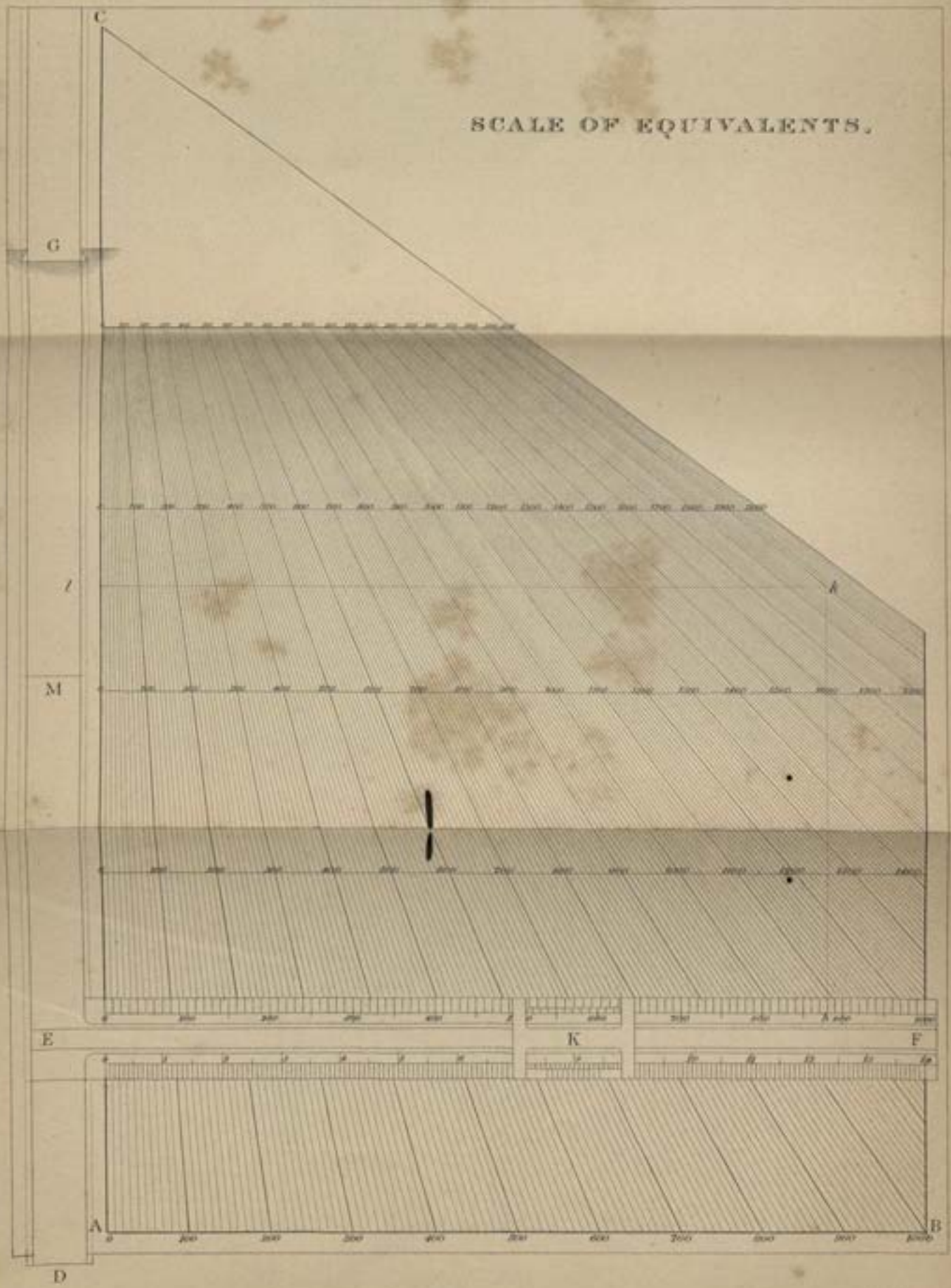
If now the divisions on the scale be assumed to represent units of any denomination, either of length, surface, bulk, weight, or value; and if, knowing that a certain number of these units is equivalent to a certain number in some other denomination, the scale be slid forward until the divisions representing the equivalent numbers coincide; then any quantity of the one kind will have its corresponding value in the other indicated by the opposite division.

For instance, 51·796 French kilogrammes are equal to 112 lbs. English; and, taking multiples for the sake of accuracy, 880·5 kilogrammes equal 1904 lbs. Then if the scale be moved along towards C until the division at *h* (880·5) coincides with the division at *k* (1904) on the converging lines, we shall have the edge of the scale occupying the position shown by the dotted line *kl*; and we shall then have a line, represented by the edge of the scale, divided on the one side into kilogrammes and on the other into English pounds. Hence any weight short of 2000 lbs., stated either in the French or the English denomination, may have its value in the opposite denomination read off at sight.

In the same manner prices and sums of money stated in some Continental currency, may have their relative values in English money ascertained; and the calculations called for by the varying rates of exchange with foreign countries, may readily be performed.

The system is applicable not only to the reduction of quantities from one denomination into another, but also to the calculation of equivalents of different orders. Thus, if any quantities given in bulk have their values in weight required, the process will be just the same: a certain number of the units of quantity corresponds to some other number of the units of weight, and the scale being adjusted so that these divisions coincide the results are read off as before. Again a list of tons and cwts. of some material charged at per ton, may have the values of the several items found; by using a sliding scale properly divided for the purpose, and assuming


E
K
F
A
B
D


SCALE OF EQUIVALENTS.
C
G
l
M
K
E
K
F
A
B
D

the large numbered divisions to represent tons. In short, any calculation coming within the sphere of ordinary proportion, provided it be within the limits of the scale, may be performed by it. The instrument is not intended to be employed in those cases where a single calculation only has to be made: the time required for adjustment would probably be greater than that taken in obtaining the result by the ordinary method. But its advantages are to be gained in cases where a number of operations of the same kind have to be gone through.

It must be understood that the divisions may be used in a variety of ways. Thus the spaces between the black numbered lines may be taken as units and their divisions as decimals, the large ones being tenths and their sub-divisions (not shown in the plate) hundredths. Or each of the divisions in the drawing may represent one and their sub-divisions tenths: each of the great divisions being then read as 10. And again, each of the ultimate divisions may be considered a unit, as instanced in the first example of the application of the instrument. The same variety of assumptions may be made with the moveable scale; and if it be remembered that in addition to the extended application allowed by making these assumptions, we may employ several scales with divisions of different magnitudes, it will be seen that there are few cases in which the instrument may not be advantageously used. To make the apparatus quite complete, the sliding scale may have a vernier attached, as shown at K.

On a first trial with the original instrument which is made of cardboard, and is otherwise incomplete in several points, and therefore takes longer intervals for adjustment, reading off, &c., than a perfect one would do, it was found that the time taken by a fast calculator (after he had found the constant) was just double that required by the instrument. With a perfect apparatus and a little practice the ratio would probably be made much greater.

APPENDIX E.

IDEAS ABOUT A UNIVERSAL LANGUAGE.

[*The following memoranda were made either at the close of* 1843 *or at the beginning of* 1844. *The primary aim was that of obtaining the greatest brevity, and, consequently, a structure mainly, or almost wholly, monosyllabic was proposed. Hence the table with which the memoranda begin, is a calculation respecting the number of good monosyllables that can be formed by the exhaustive use of good consonants and good vowel sounds. I have thought it better to let these memoranda stand as they originally did; though, being set down when I was but* 23, *and without any extensive inquiries into the matter, they are of course very imperfectly thought out. Respecting the table I may say that, on looking now at the method of estimation, I suspect the number of monosyllables is considerably greater than that given.*]

LIST OF SINGLE SYLLABLES.

With the 8 *Simple Vowels.*

Syllables with simple initial consonant and vowel	....	....		144
Do. with terminal do. do.	....	....		144
With simple consonants initial and terminal	....			2592
With compound do. do.	....	....	....	29664

With the 18 *Compound Vowels.*

Syllables with simple initial consonant and vowel	....	....		324
Do. with terminal do. do.	....	....		324
With simple consonants initial and terminal	....	....		5832
With compound do. do.	....	....	....	66744
Total monosyllables	....	....		105768

Addenda (*Simple Vowels*).

Syllables with initial compound consonant and vowel	....		240
Do. terminal do. do.	....		528

Compound Vowels.

Syllables with initial compound consonants and vowels	....		540
Do. terminal do. do.	....		1188
Total	....	....	108264

[The following were suggestions made respecting the constructions and the uses of these syllables.]

All nouns to have the short vowel in the singular, and the plural to be denoted by changing it into the long vowel.

The compound vowels ⌟, ⌝, ⌞, ⌜, &c., which are not capable of the short sound, to be used for adjectives; and the vowel to be in some degree indicative of the quality of the adjective. Let, for instance, all adjectives indicative of good quality be made with the ⌟ and those of the bad with the ⌝.

All nouns to be perfect articulations, beginning and ending with consonants, and let them show their relationships to each other by the initial or terminal consonant. All abstract nouns might, for instance, commence with the nasals. All inanimate nouns with the mutes. All animate with the semi-vocals.

All words which are nearly related to one another in meaning to have their relationships indicated by identity of consonants—the vowel sounds being different; so that there may be no chance of mistake arising from imperfect articulation. It is necessary that words having related meanings should have marked differences of sound, because the *context* will not show which is intended when the articulation is indistinct.

The change of nouns into adjectives and adjectives into verbs, to be produced by the addition of consonants without in any case making an additional syllable.

[There were, I remember, sundry plans not here set down, by the aid of which the choice of words for things and actions was to be made systematic; so that there should be comparatively little arbitrary choice. A cardinal idea was that in each genus of things or actions, the generic word should always have the indefinite, or most general, vowel-sound, the *e* in err—the sound made without any adjustment of the vocal organs, and the sound first made by the infant. This would, as it were, express the genus in its undifferentiated state; and the specific kinds of things falling within the genus, would severally have the same consonants but would contain the various definite vowels, simple and compound. Thus, supposing an elevation of surface, small or great, to be expressed by a syllable which, between its initial and terminal consonants, had the indefinite vowel sound of *e* in err, then the kinds of elevation—hillock, mound, hill, mountain, great mountain, peak, &c.—would be severally indicated by words in which the same two consonants would include between them others of the various vowels. A further idea was to use what may be called analogical onomatopœia: the small and petty things being in every case indicated by thin unsonorous vowels, and great or imposing things by open and sonorous vowels: the degrees in size following the scale,

e, a, ā (ah), aw, o, oo. Variations among these various sizes were to be implied by compound vowels severally formed out of these simple vowels. Thus a hillock, or very small elevation, would, using the same consonants, have the vowel *e* (as in see); an elevation of medium size, as a hill, would have the open *a* (as in ah), while the greater elevations, mountains and peaks, would have the vowel sounds *aw*, *o*, *oo*, to severally distinguish their respective sizes. This done systematically would, besides excluding, in large measure, arbitrary choice, give to the very sounds themselves a great suggestiveness. The mental association would be rendered irresistible, both by its naturalness and by its perpetual recurrence.

Of course the same system would be adopted in the choice of words for adjectives and verbs: the degree of a quality and the power of an action being similarly indicated by gradations from the feebly-sounding vowels to the loud-sounding vowels. The result of these selections would be that even when some sentence was very indistinctly heard, it would be known at once whether it concerned small things and feeble actions or great things and forcible ones.

Systematic choice of words was to be carried out in another way. The most euphonious consonants were to be used for things and qualities and acts of most frequent occurrence in speech, and the less and less euphonious ones for the things and qualities and acts gradually decreasing in the frequency of their use. While this would serve as one guide in the selection of consonants, another guide would be the analogical onomatopœia: the euphonious consonants being used for things which appeal agreeably to the feelings, and the less and less euphonious ones for things which are less attractive in their natures, or are repulsive. Two such words as "rough" and "smooth" exemplify the use of both consonants and vowels under guidance of analogical onomatopœia; for the vowel-sound in "smooth" is one appropriately indicating something unresisting and regular, such as a smooth surface, while the first consonantal sound in "rough" well expresses the irregular and resisting quality of a surface. Evidently selections of vowels and consonants, if habitually made in these ways, would still further limit the arbitrariness of choice, and would still further tend to make the language both euphonious and expressive.

Among further memoranda there were "Notes for a system of verbs," which I do not reproduce, because, although I see no reason to abandon the general idea, the matter is one requiring wider inquiry than I gave to it. I may simply say that the avowed intention was that of carrying out completely the mode of organization to which our own language, in diverging from the older languages, has approached—the entire abandonment of

inflections, and the development of a complete set of relational words to indicate the several conditions under which an action occurs. The implied belief was that since each kind of action remains in itself the same, whatever may be its circumstances in respect of position in time or relation to actor or actors, the sign of such action should similarly remain constant; and that all its various relations of person, tense, and mood, should be expressed entirely by appropriate relational words. Of course the same principle was to be carried out in the case of nouns.]

MEMORANDA CONCERNING ADVANTAGES TO BE DERIVED FROM THE USE OF 12 AS A FUNDAMENTAL NUMBER.

The fact that 12 has been so generally chosen as a convenient number for enumeration of weights and measures, is presumptive proof that it must have many advantages. We have 12 oz. = 1 pound in Troy weight and Apothecaries weight, 12 pence = one shilling, 12 months in the year, 12 signs to the Zodiac, 12 lines to the inch, 12 inches to the foot, 12 sacks one

10 divided by

Div.	Gives.	Quotient.	Character.	
2	—	5	Complete	
3	—	3·3333	Bad	2 complete.
4	—	2·5	Middling	2 middling.
5	—	2	Complete	4 bad.
6	—	1·6666	Bad	
7	—	1·4285	Bad	
8	—	1·25	Middling	
9	—	1·1111	Bad	

12 divided by

Div.	Gives.	Quotient.	Character.	
2	—	6	Complete	
3	—	4	Complete	
4	—	3	Complete	4 complete.
5	—	2·497	Bad	2 middling.
6	—	2	Complete	4 bad.
7	—	1·86(12)	Bad	
8	—	1·6	Middling	
9	—	1·4	Middling	
10	—	1·249	Bad	
11	—	1·1111	Bad	

last, and 12 digits. Of multiples of 12 we have 24 grains one pennyweight, 24 sheets one quire, 24 hours one day, 60 minutes one hour, 360 degrees to the circle.

Were our number of notation altered to 12, our multiplication table, going up to 12 times 12, would then agree in its extent with the requirements of the system: it would go as far as necessary and no further.

The great advantage, however, is the easy divisibility. 10 divides completely only by 2 and 5, of which the last is of comparatively little use, as fifths are seldom required. 12 divides completely by 2, 3, 4, and 6.

To make a proper comparison of these divisibilities we may reject those in each class which are on a par.

In the two sets division by 7 is equally bad.

9 in the one and 11 in the other are equally bad and equally unimportant.

6 in the one and 10 in the other are equally bad and equally unimportant.

The 8's in both cases are nearly equal, but in the 12 scale is rather the best.

The 2 is common to both.

Of the remainder of the 10 scale 5 is perfect; but fifths are comparatively little wanted; while 3 is bad and 4 middling.

Of the other scale 3, 4, and 6 are perfect, 9 is middling, and 5 is bad.

Again, the attribute of dividing power is very important from several points of view. In the first place it affords facility in the practice of division. Under the present system there are only two numbers out of the 12 whose capability of dividing can be seen by inspection, and these are 2 and 5; that is, 2 out of 12, or $\frac{1}{6}$ of the whole number

In the other system inspection will show whether any number is divisible by 2, 3, 4, and 6; that is, 4 figures out of the 12, or $\frac{1}{3}$. Thus it is clear that less time will be lost in trial divisions.

Nor does this facility apply only to cases of short division: an increased facility is also produced in long division. Under the present arrangement, if the last digit of the quotient ends with 2 or 5, the possibility of division may be seen on inspection, that is, in 2 figures out of 10 or only $\frac{1}{5}$ of the cases.

Under the other arrangement the same facility would be given to 2, 3, 4, and 6, or 4 out of 12, or $\frac{1}{3}$ of the cases.

To sum up:—In respect of divisibility, if we exclude from the comparison the equally bad and the equally middling cases, it results that the 12-notation has just twice the advantages of the 10-notation. And in respect of dividing-power we see that the advantages of the first as compared with those of the second are in some cases as 2 to 1 and in other cases as 5 to 3.

APPENDIX F.

REMARKS ON THE THEORY OF RECIPROCAL DEPENDENCE IN THE ANIMAL AND VEGETABLE CREATIONS, AS REGARDS ITS BEARING UPON PALÆONTOLOGY.

[*From the "Philosophical Magazine" for February*, 1844.]

Upon perusing an article which some time since appeared in the "Philosophical Magazine," explanatory of M. Dumas' views respecting the peculiar relationship which exists between plants and animals,* in so far as their action upon the atmosphere is concerned, it occurred to me that the doctrine there set forth involved an entirely new and very beautiful explanation of the proximate causes of progressive development; and as the idea does not seem to have been yet started, perhaps I may be allowed to make your journal the medium for its publication.

In unfolding the several results of the theory and exhibiting its application in the solution of natural phenomena, M. Dumas adverts to the fact, that not only do the organisms of the vegetable kingdom decompose the carbonic acid which has been thrown into the atmosphere by animals, but that they likewise serve for the removal of those extraneous supplies of the same gas which are being continually poured into it through volcanos, calcareous springs, fissures, and other such channels. It is to the corollary deducible from this proposition, respecting the alterations that have taken place in the composition of that atmosphere, that attention is requested.

If it had been found that during the past epochs of the world's existence, animals had always borne such a proportion to plants as to insure the combustion of the whole of the carbon assimilated by them from the air, or in other words, if the carbon-reducing class had always been exactly balanced by the carbon-consuming class, it would then follow that, as the gas decomposed in the one case was wholly recomposed in the other, the only change that could have taken place in the character of the atmosphere would have been a deterioration resulting from the continual influx of carbonic acid from the above-mentioned sources. Such, however, were not the con-

* "Philosophical Magazine," Series 3, vol. xix, p. 337.

aitions of the case; for it is manifest, not only from the nature of existing arrangements, but likewise from the records of the world's history, that the vegetable kingdom has always had such a preponderance as to accumulate a much larger supply of carbon than could be consumed by animals. This was especially the fact in the earlier æras. During those vast periods that expired before the appearance of mammalia, and whilst animate life was chiefly confined to rivers and seas, nearly the whole of the immense masses of vegetation that then covered the land, apparently with a much more luxuriant growth than now, must have lived and died untouched by quadrupeds; and even though a certain portion of the carbon taken by them from the atmosphere was again restored to it in the process of decomposition, by far the greater bulk seems to have remained in its uncombined form. Even after the creation of the higher orders of vertebrata, when the forests were inhabited by the Mylodon with its congeners, and subsequently by the elephant and others of the Pachydermata, it cannot be supposed that there was ever by their instrumentality an equilibrium produced between those antagonist agencies—the vegetable and animal creations. For although herds of such creatures would doubtless commit extensive ravages upon the vegetation amid which they existed, it must be remembered that they could only consume the young and comparatively succulent portions of the trees upon which they fed, whilst the whole of the carbon contained in the trunks and older branches would remain untouched. That the same preponderance in the assimilative power of the vegetable organisms over the consuming power of the animal ones exists at the present day is abundantly evident.

The fact of there having been a larger abstraction of carbon from the atmosphere by the decomposition of its carbonic acid gas than has ever been returned to it, will, however, be most distinctly proved by a reference to purely geological data. The vast accumulations of carbonaceous matter contained in the numerous coal-basins distributed over the surface of the globe, the large proportion of bitumen existing in many of the secondary deposits, to say nothing of the uncombined carbon which must be diffused through a great part of the strata composing the Earth's crust, bear palpable witness to the truth of the position. All such combustible material has been originally derived from the air, and the fact of its remaining to the present day unoxidized, and bidding fair to continue in the same condition (setting aside human agency), for an indefinite period, strongly favours the conclusion that the carbon of which it is composed has been permanently reduced from the gaseous combination in which it previously appeared.

If, then, it be conceded that the carbonic acid which, during past æras escaped out of the Earth, has been continually undergoing the process of de-carbonization, it follows as an apparently legitimate consequence, that its remaining constituent, the oxygen, being thus constantly liberated and diffused into the atmosphere, now exists in that medium in a larger proportion than it originally did, and that it has from the commencement of vegetable life to the present day been ever on the increase.

To this inference there may, however, be raised objections. It will possibly be said that the carbonic acid which in time past issued by various channels out of the Earth, arose from the slow combustion of carbonaceous deposits produced in the same way as those now existing; that the continuance of the like phenomenon in our own day is due to the gradual destruction of the same material; and that the strata of our coal-fields are fated to undergo, by some future volcanic agency, a similar revolution, and have their carbon once more sent into the air in company with oxygen. Or it might perhaps be argued that the oxygen set free by the instrumentality of plants has entered into combination with some other element in place of the carbon with which it was associated, and has thus been again abstracted from the air as fast as it was added to it.

The first of these objections is plausible, in so far as the possibility of such an arrangement is concerned, though it does not appear to be countenanced by facts. Neither the positions usually occupied by volcanos, nor the phænomena attending their eruptions, seem to indicate that the carbonic acid they evolve proceeds directly from the combustion of carbonaceous matter. They rather imply that it has been driven off from its combinations by heat or chemical affinity. In the cases of calcareous springs it would also appear that the gas liberated by them had been previously in connexion with an earth, it may be for an indeterminate period. Moreover, it should be borne in mind that the ultimate tendency of all chemical changes taking place in the interior of the globe must be to oxidize the most combustible elements; and since the greater part of the abundant metallic bases have a stronger affinity for oxygen than carbon has, its continual *de-oxidation* would result, rather than any action of the opposite character. But even admitting the existence of some play of affinities by which the carbonaceous matter deposited in the course of one æra is transformed into carbonic acid and given back to the atmosphere during another, there is still a link wanting to complete the chain of this circulating system; for it is clear that the oxygen which accompanies the carbon in each of its re-appearances above ground has been derived from some internal source, and when it has once issued

into the air and been deprived of its carbon it has no visible means of regaining its previous condition, and must consequently remain in the air. On this assumption, therefore, we are still brought in a great degree to the same conclusion. Here, indeed, the second objection may perhaps be brought in aid of the first, and in such case it would be said that the oxygen after being liberated is again absorbed by other agencies, and ultimately carried down once more into the interior. This is, however, rather a groundless supposition: there being no apparent mode in which such process could be carried on, seeing that the surface of the Earth is already oxidized, and, as far as we can judge, has always been so.

Assuming, then, that the proposed theory, supported as it is by the fact that the constituents of the atmosphere are *not in atomic proportions*, and borne out likewise by the foregoing arguments, is correct, let us mark the inferences which may be drawn respecting the effects produced upon the organic creation.

Superior orders of beings are strongly distinguished from inferior ones by the warmth of their blood. A low organization is uniformly accompanied by a low temperature, and in ascending the scale of creation we find that, setting aside partial irregularities, one of the most notable circumstances is the increase of heat. It has been further shown, by modern discoveries, that such augmentation of temperature is the direct result of a greater consumption of oxygen; and it would appear that a quick combustion of carbonaceous matter through the medium of the lungs is the one essential condition to the maintenance of that high degree of vitality and nervous energy without which exalted psychical or physical endowments cannot exist.

Coupling this circumstance with the theory of a continual increase in the amount of atmospherical oxygen, we are naturally led to the conclusion that there must of necessity have been a gradual change in the character of the animate creation. If a rapid oxidation of the blood is accompanied by a higher heat and a more perfect mental and bodily development, and if in consequence of an alteration in the composition of the air greater facilities for such oxidation are afforded, it may be reasonably inferred that there has been a corresponding advancement in the temperature and organization of the world's inhabitants.

Now this deduction of abstract reasoning we know to be in exact accordance with geological observations. An inspection of the records of creation demonstrates that such change has taken place, and although remains have from time to time been found which prove that beings of an advanced development

existed at an earlier period than was previously supposed, still the broad fact is not by any means invalidated. A retrospective view of the various phases of animal life, tracing it through the extinct orders of mammalia, saurians, fishes, crustacea, radiata, zoophytes, &c., shows distinctly that whatever may have been the oscillations and irregularities produced by incidental causes, the average aspect nevertheless indicates the law of change alluded to, seeing that there appears to have been an æra in which the Earth was occupied exclusively by cold-blooded creatures, requiring but little oxygen; that it was subsequently inhabited by animals of superior organization consuming more oxygen; and that there has since been a continual increase of the hot-blooded tribes and an apparent diminution of the cold-blooded ones.

Bearing in mind, therefore, the undoubted relationship that exists between the consumption of oxygen on the one hand and the degree of vitality and height of organization on the other, it would appear extremely probable that there is some connexion between the supposed change in the vital medium and the increased intensity of life and superiority of construction which have accompanied it. Whether the alteration that has taken place in the constitution of the atmosphere, is to be looked upon as the *cause* of this gradual development of organic existence, or whether it is to be regarded as an arrangement intended to prepare the Earth for the reception of more perfect creatures, are points which need not now be entered upon. The question at present to be determined is, whether the alleged improvement in the composition of the air has really happened, and, if so, whether that improvement has had anything to do with the changes that have taken place in the characteristics of the Earth's inhabitants.

[Sundry objections may be urged against the propositions embodied in this essay, as well as against its conclusion. I reproduce it not so much because of its intrinsic value as because it illustrates, in another direction, the speculative tendency otherwise variously illustrated.]

APPENDIX G.

LEVELLING APPLIANCES.

Figs. 1 and 2 show the old and the new modes of dividing levelling staves. When by great distance, or waning light, or fog, or rain, the hundredths are rendered invisible, the new form renders the tenths visible; and they can be divided by the eye with approximate correctness. Further, the correspondence between longer lines and higher decimals, excludes certain errors in reading.

Fig. 3 shows an appliance for plotting sections. *ab* is a straight-edge, placed parallel to the datum line *cd*, at the appropriate distance. *e* is a set-square, made thick to admit of the bevelled edge shown in section at *f*, Fig. 4. On to this, and under the clips *hh*, is thrust the scale *g*, to which the particular section is to be plotted. The zero mark having been adjusted to the datum line, and the distance points having been marked, it requires only that the scale should be brought to each of them, and the corresponding height in the level-book pricked off: the ground surface, *ki*, being then drawn through the marks.

A new form of level is shown in elevation by Fig. 5, and in plan by Fig. 6. *ab* is the telescope (on which is the compass, *c*) fixed on an elongated brass plate, *ddd*. *ee* is the longitudinal bubble, and *f* is a circular bubble for rough adjustment. On the underside of the plate, *dd*, is a circular rim, *g*, shown in section at Fig. 7, which works upon a corresponding rim on the upper parallel plate. At *i* is the conical head of a screw on which, as its centre, the plate, *dd*, rotates. This screw, sufficiently tightened to give firm but easy rotation, passes through the upper parallel plate into the axis of the parallel plates; and, the screw being prevented from rotating, the central axis of the parallel plates is then tightened upon it, so that thereafter it cannot turn. The advantages are (1) that a much smaller area is exposed to the wind; (2) that this area, being nearer to the point of support, the wind has less leverage, the result being decreased vibration; and (3) that the bubble and the telescope being independent of one another, the line of collimation can be easily adjusted.

Fig. 1.

Fig. 2.

Fig. 3.

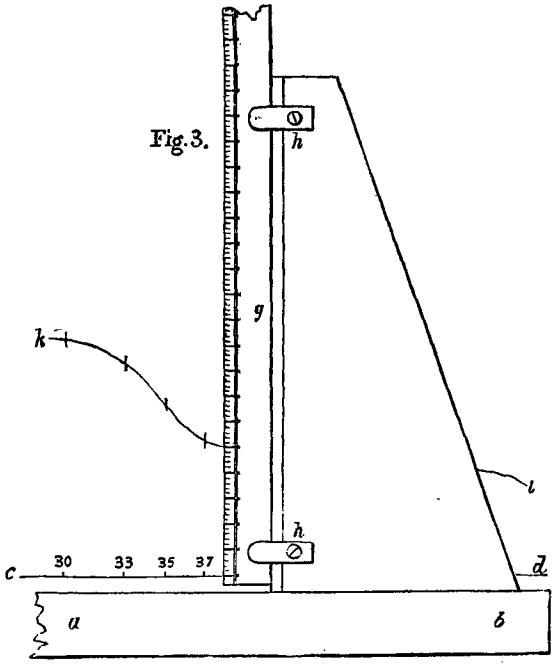


Fig. 4.

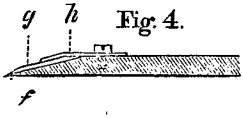


Fig. 5.

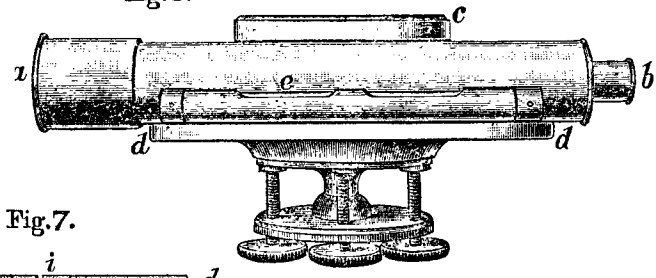


Fig. 7.

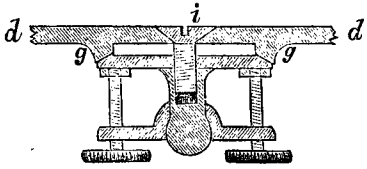
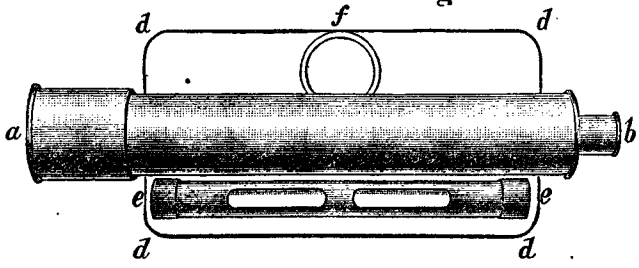


Fig. 6.



APPENDIX H.

ON A PROPOSED CEPHALOGRAPH.

[*This instrument was devised at the beginning of* 1846, *and the description of it was, as I infer from its character, intended to be published in "The Zoist," to which I then occasionally contributed. A sample instrument, which I had made, was so ill made that it would not work. Partly disgust and partly pre-occupation prevented me from prosecuting the matter at the time, and before my thoughts were again turned to it, I had become sceptical about current phrenological views, and no longer felt prompted to employ a better instrument-maker. I here give the drawings and description, because, apart from my intended use of it, it may, I think, be useful to anthropologists as a means of obtaining exact delineations of individual skulls and, by composition of them, exact delineations of types of skulls.*]

The use of our present imperfect mode of manipulation has been a great hindrance to the advance of Phrenology. To determine by touch or inspection, not only the relative sizes of the organs in a given head, but the ratio each of them bears to the average development of the same organ in other heads, is a task which no man, however acute his perceptions, is competent to execute with precision. It is first necessary that he should have a correct ideal standard with which he may mentally compare the head under examination; and even supposing him to have had a sufficiently wide experience for the formation of such a standard (which is very improbable), it is still unlikely that out of the variously formed heads examined, an exact average one has been conceived, that will correctly serve as a national type, both of size and configuration.

Neither is it an easy matter to estimate accurately the comparative sizes of the different parts of the same head. Between adjacent organs the ratio may be observed with some nicety, but to ascertain the relative developments of Sympathy and Combativeness, it is necessary to get a correct notion of the general dimensions of the head, and this cannot be obtained by mere manual examination with anything like certainty.

It may be further remarked that our statements of development must always continue very approximate, so long as we

have no mode of determining *how much* greater or less than ordinary each particular organ may be.

The secure the great desideratum—a precise mode of measuring the head—several plans have already been invented, but, judging by their disuse, none of them have answered. In the hope that it may more effectually serve the intended purpose, the writer ventures to propose the instrument about to be described.

ABC (Fig. 1) is a triangular piece of mahogany, ebony, or other hard wood, having the angle ABC a right angle, and being similar in general form to what is technically called a set-square. D and E are smaller set-squares, mortised into the sides of ABC, for the purpose of keeping the edge AB at right angles to the surface against which the base, CDBE, of the

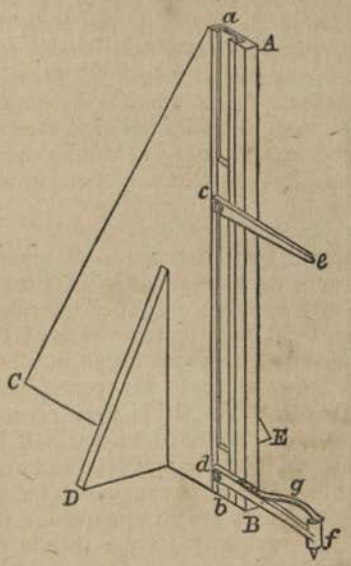
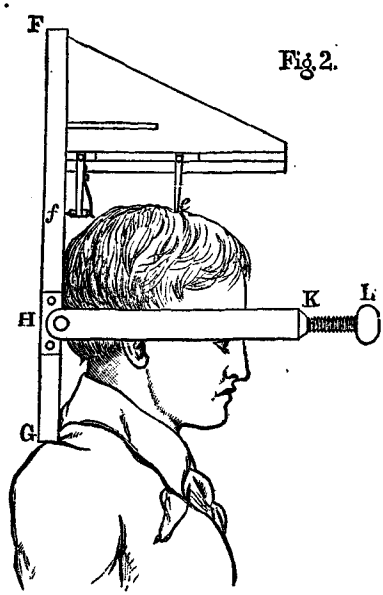


Fig. 1.

apparatus is placed. *ab* is a dovetailed groove, parallel to AB, and containing two slides, *c* and *d*, which are capable of being fixed by set-screws at any desired points. To these slides are attached the arms *e* and *f* of exactly the same lengths; the one ending in a rounded point, and the other carrying at its extremity a short tube enclosing an accurately fitted, metal-cased pencil, which is constantly pressed by the spring *g* against the surface upon which the instrument is placed. The general object of the arrangement is to keep the extremity of the index *e*, in all cases, vertically above the point of the pencil *f*.

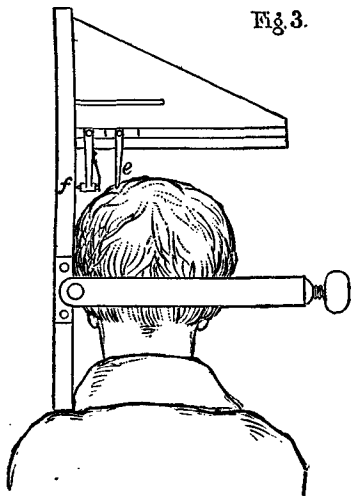
Figs. 2, 3, and 4 show the mode of application. An approximate result may be obtained by placing the head against a door or a wall, with a sheet of paper interposed, requesting the subject to hold himself as steady as possible. To insure accurate diagrams, however, it is necessary to make use of a board, FG (Fig. 2), with a semicircular hoop, HK, moveable about a hinge, H, at each edge of the board, and having in the centre a screw, L, with a pad at its extremity, capable of being pressed against the head with the force requisite to keep it in the desired situation. A piece of paper having been attached to the board and the patient fixed, the instrument is adjusted to the position requisite for describing the intended section; and the extremity of the index, *e*, is then made to traverse the surface of the head from side to side, or from front to back, as the case may be, while the pencil *f*, being kept in contact with the paper, traces upon it a duplicate of the line moved over by the end of the index, and describes the required section. It will be seen, from Fig. 2, that, by fixing the index at different points

Fig. 2.



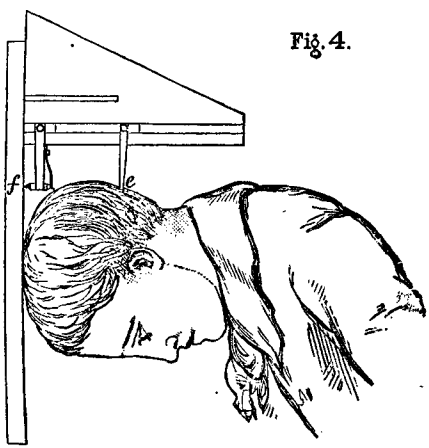
in the groove, as many transverse sections may be described as are desired. Fig. 3 shows the same facility for obtaining longitudinal sections. And in Fig. 4 we have the arrangement for drawing horizontal ones, exhibiting the entire circumference of the head.

Fig. 3.



By superposing diagrams thus made on semi-transparent paper, there would be obtained an average form characterising

Fig. 4.



the race, and serving as a standard with which individual forms could be compared.

APPENDIX I.

REGISTERED BINDING-PINS, FOR SECURING MUSIC AND UNBOUND PUBLICATIONS.

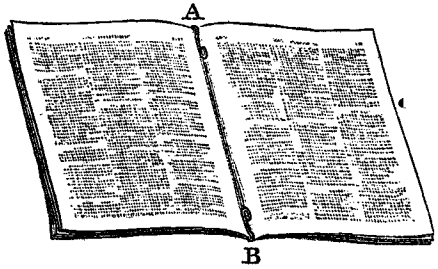
[*The little appliance described below, was brought out, not in my name, but in the name of Messrs. Ackermann and Co., of* 96, *Strand (a firm no longer in existence), who undertook the business arrangements on commission. I am not responsible for the wording of the description. It is reproduced from the advertising leaflet issued by Messrs. Ackermann.*]

The Registered Binding-Pin is in every respect the best article yet introduced for holding loose manuscripts, sermons, music, weekly papers, and all unstitched publications.

It consists simply of a piece of elastic wire bent into the form and size represented in Fig. 1.

Fig. 1.

Fig. 2.



To secure any periodical, manuscript, or piece of music, nothing more is required than to thrust one pin (the straight limb being kept on the outside) over the top, and another over the bottom of the central fold—that is at the points A and B, Fig. 2. The leaves being then cut (if a newspaper or periodical) it will be found that the several sheets are firmly clasped together.

This little apparatus, which appears incapable of further simplification, possesses several advantages.

1. It economises time and trouble: a few seconds only being expended in its application.

2. It involves no damage to the publication, and the sheets held by it are in a better state for permanent binding than after any other treatment.

3. It presents no obstacle to the folding of the paper in any direction.

4. It admits of being used repeatedly, if desired.

5. It is quite out of the way, and is rather ornamental than unsightly.

6. It is very cheap. Cards containing four dozen plain pins are sold for Sixpence, and those containing fifty gilt pins (especially adapted for music and superior publications) for One Shilling.

[On the back of the advertising fly-leaf reproduced above were a number of highly eulogistic opinions of the Press, foretelling for the Binding-Pin an extensive and permanent use. The result, which was that the sales, great at first, came to an end after a year or so, proved how erroneous were the conceptions of the critics as to public tastes and requirements.

Except in matters of prime necessity, the universal demand on the part of retailers, probably because it is the demand on the part of ladies, is for something new. The mania for novelty is so utterly undiscriminating that in consequence of it good things continually go out of use, while new and worse things come into use: the question of relative merit being scarcely entertained.]

APPENDIX J.

THE FORM OF THE EARTH NO PROOF OF ORIGINAL FLUIDITY.

[*From the "Philosophical Magazine" for March*, 1847.]

It has been generally considered that the spheroidal form of the Earth—indicating as it does obedience to centrifugal force—implies a primary state of fluidity. If, however, it can be shown that, notwithstanding its apparent solidity, the Earth must be at the present moment entirely subject to the influences affecting its general figure, and that so far as the gravitative and centrifugal forces are concerned it is plastic still, the theory of original fluidity, however probable on other grounds, can no longer be inferred from the Earth's oblateness.

The facts indicative of a varying relationship between the bulk and tenacity of matter are of every-day observation. We constantly see a drop of water maintain its sphericity in spite of opposing forces; increase the mass, and it flows out in complete obedience to them. The mud in our streets stands in ridges behind the passing cart-wheel; when scraped together it appears liquid and assumes a horizontal surface. On the spade of the excavator, clay retains its square figure and its sharp angles; but when made into a bulky embankment, it will, if the slope be insufficient, spread itself out on one or both sides of the base: occasionally continuing to slip until it assumes an inclination of six to one.

A comparison of the physical powers of large and small animals exhibits a series of facts of analogous character. A flea jumps several hundred times its own length, and is uninjured by collision with any obstacle. The greatest mammals, on the other hand, seem to possess no agility whatever; and a concussion borne by the insect with impunity would smash an elephant to a jelly. Between these extremes may be observed a gradation in the ratios of power to bulk; so that commencing with the smaller creatures, every increment of size is, *cæteris paribus*, accompanied by an under-proportionate increase of strength, until we arrive at that limit (to which the elephant has evidently approximated) where the creature is no longer capable of supporting its own framework.

These, and innumerable like facts, point to the inference that fluidity and solidity are to a great extent qualities of degree; that the cohesive tenacity of any piece of matter bears, as the mass of that matter is increased, a constantly decreasing ratio to the natural forces tending to the fracture of that matter; and that hence any substance, however solid to our perceptions, only requires to have its bulk increased to a certain point, to give way, and become in a sense *fluid* before the gravitative and other forces.

However repugnant to that "common sense," for which some have so great a respect, this proposition is capable of a very simple demonstration.

The strength of a bar of iron, timber, or other material subjected to the transverse strain, varies as $\frac{BD^2}{L}$; B being the breadth, D the depth, and L the length. Suppose the size of this bar to be changed, while the ratios of its dimensions continue the same; then as the fraction $\frac{B}{L}$ will remain constant, the strength will vary as D^2, or (since D bears always the same proportion to B and L) as B^2 or L^2. Hence in similar masses of matter the resistances to the transverse strain are as the squares of the linear dimensions. The same law still more manifestly applies to the longitudinal strain. Here the strength, depending as it does on the sectional area, must, in similar masses, vary as the square of any side. And in the torsion strain we may readily detect the like general principle, that, other things equal, the resistances to fracture bear a constant ratio to the squares of the dimensions. [This last statement is, I think, erroneous; but the error does not affect the argument.]

Not so, however, with the powers tending to the disruption of matter. The effects of gravity, centrifugal force, and all agencies antagonistic to cohesive attraction, vary as the mass, that is, as the cubes of the dimensions.

However great, therefore, in a given portion of matter, may be the excess of the form-preserving force over the form-destroying force, it is clear that if, during augmentation of bulk, the form-preserving force increases only as the *squares* of the dimensions, whilst the form-destroying force increases as their *cubes*, the first must in time be overtaken and exceeded by the last; and when this occurs, the matter will be fractured and re-arranged in obedience to the form-destroying force.

Viewed by the light of this principle, the fact that the Earth is an oblate spheroid does not seem to afford any support to the hypothesis of original fluidity as commonly understood. We must consider that, in respect of its obedience to the geo-

dynamic laws, the Earth is fluid now and must always remain so; for the most tenacious substance with which we are acquainted, when subjected to the same forces that are acting upon the Earth's crust, would exceed the limit of self-support determined by the above law, before it attained $\frac{1}{1,000,000,000}$th of the Earth's bulk. [This is an extreme over-statement, since it assumes that the mutual gravitation of the parts of this small mass would expose them to a stress like that to which they would be exposed were the mass placed on the surface of the existing Earth. Still it remains true that a mass of the hardest matter would lose its self-sustaining power long before it approached the size of the Earth.]

Reference to a table of the resistances of various substances to a crushing force will render this manifest.

London, January, 1847.

APPENDIX K.

LETTER TO *THE ATHENÆUM* CONCERNING THE MISSTATEMENTS OF THE REV. T. MOZLEY.

[*I am compelled to include among these appendices the correspondence which follows. The grave error rectified by it is contained in Mr. Mozley's work "Reminiscences, chiefly of Oriel College," likely to be often referred to hereafter by those interested, as friends or foes, in the Tractarian movement; and there will consequently be a perennial cause for diffusion of Mr. Mozley's misstatements. Proof exists that already mischief has been done. In a notice of Mr. Mozley's work in the "Quarterly Review," his wrong allegation is partially, if not wholly, accepted. Clearly, then, if in his work this wrong allegation has a permanent place, and I do not give a permanent place to the disproof of it, I shall be liable hereafter to grave misrepresentations, and the origin of the Synthetic Philosophy will be misapprehended. I have, therefore, no alternative but to reproduce these letters.*]

The Rev. Thomas Mozley and Mr. Herbert Spencer.

In the "Reminiscences, chiefly of Oriel College," by the Rev. Thomas Mozley, there occurs on p. 146, vol. i, the following passage:—

"I had indulged from my boyhood in a Darwinian dream of moral philosophy, derived in the first instance from one of my early instructors. This was Mr. George Spencer, [honorary] Secretary of the Derby Philosophical Association founded by Dr. Darwin,* and father of Mr. Herbert Spencer. My dream had a certain family resemblance to the 'System of Philosophy' bearing that writer's name. There was an important and saving difference between the two systems, between that which never saw the light, and perished before it was born, without even coming to wither like grass on the house-tops, and that other imposing system which occupies several yards of shelf in most public libraries. The latter makes the world of life, as we see and take part in it, the present outcome of a continual outcoming from atoms, lichens,

* It was more than a dozen years after Dr. Darwin's death in 1802 when my father became honorary secretary. I believe my father (who was twelve years old when Dr. Darwin died) never saw him, and, so far as I know, knew nothing of his ideas.

and vegetables, bound by the necessities of existence to mutual relations, up to or down to brutes, savages, ladies and gentlemen, inheriting various opinions, maxims, and superstitions. The brother and elder philosophy, for such it was, that is mine, saved itself from birth by its palpable inconsistency, for it retained a Divine original and some other incongruous elements. In particular, instead of rating the patriarchal stage hardly above the brute, it assigned to that state of society a heavenly source, and described it as rather a model for English country gentlemen, that is, upon the whole, and with certain reservations."

As I find by inquiring of those who have read it, this passage leaves the impression that the doctrines set forth in the "System of Synthetic Philosophy," as well as those which Mr. Mozley entertained in his early days, were in some way derived from my father. Were this true, the implication would be that during the last five-and-twenty years, I have been allowing myself to be credited with ideas which are not my own. And since this is entirely untrue, I cannot be expected to let it pass unnoticed. If I do, I tacitly countenance an error, and tacitly admit an act by no means creditable to me.

I should be the last to under-estimate my indebtedness to my father, for whom I have great admiration, as will be seen when, hereafter, there comes to be published a sketch of him which I long ago prepared in rough draft. But this indebtedness was general and not special—an indebtedness for habits of thought encouraged rather than for ideas communicated. I distinctly trace to him an ingrained tendency to inquire for causes—causes, I mean, of the physical class. Though far from having himself abandoned supernaturalism, yet the bias towards naturalism was strong in him, and was, I doubt not, communicated (though rather by example than by precept) to others he taught, as it was to me. But while admitting, and indeed asserting, that the tendency towards naturalistic interpretation of things was fostered in me by him, as probably also in Mr. Mozley, yet I am not aware that any of those *results* of naturalistic interpretation distinctive of my works are traceable to him.

Were the general reader in the habit of criticising each statement he meets, he might be expected to discover in the paragraph quoted above from Mr. Mozley, reasons for scepticism. When, for example, he found my books described as occupying several yards of library shelves, while in fact they occupy less than 2 feet, he might be led to suspect that other statements, made with like regard for effectiveness rather than accuracy, are misleading. A re-perusal of the last part of the paragraph might confirm his suspicion. Observing that, along with the allegation of "family resemblance," the closing sentence admits that the course of human affairs as conceived

Mr. Mozley was the reverse in direction to the course leged by me—observing that in this only respect in which [r. Mozley specifies his view, it is so fundamentally anti-volutionary as to be irreconcilable with the evolutionary view -he might have further doubts raised. But the general reader, ot pausing to consider, mostly accepts without hesitation what writer tells him.

Even scientific readers—even readers familiar with the con-nts of my books, cannot, I fear, be trusted so to test Mr. [ozley's statement as to recognize its necessary erroneousness; nough a little thought would show them this. They would ave but to recall the cardinal ideas developed throughout the ries of volumes I have published, to become conscious that ese ideas are necessarily of much later origin than the period which Mr. Mozley's account refers. Though, in Rumford's y and before, an advance had been made towards the doctrine the correlation of heat and motion, this doctrine had not come current; and no conception, even, had arisen of the ore general doctrine of the correlation and equivalence of the ysical forces at large. Still more recent was the rise and tablishment of the associated abstract doctrine commonly nown as the "conservation of energy." Further, Von Baer's scovery that the changes undergone during development of ch organic body are always from the general to the special, as not enunciated till some eight years after the time at which r. Mozley was a pupil of my father, and was not heard of in gland until 20 years after. Now, since these three doctrines e indispensable elements of the general theory of evolution, he last of them being that which set up in me the course of ought leading to it,)* it is manifest that not even a rude con-ption of such a theory could have been framed at the date ferred to in Mr. Mozley's account. Even apart from this, one ho compared my successive writings would find clear proof at their cardinal ideas could have had no such origin as Mr. ozley's account seems to imply. In the earliest of them—Letters on the Proper Sphere of Government"—published in 842, and republished as a pamphlet in 1843, the only point of

* I have recently found that this statement is but partially true. In the iginal edition of *Social Statics*, published in 1850, and on pp. 451-3 (in e last edition, pp. 263-6), will be found a passage showing that, alike in pes of animals and in types of societies, the progress is from uniformity to ultiformity—from structures made up of like parts having like functions, structures made up of unlike parts having unlike functions. Though ither the words uniformity and multiformity, nor the words homogeneous id heterogeneous, are used, yet the contrasts described are those expressed by these words. The effect of Von Baer's generalization respecting the course of embryonic development, first met with in 1852, was to accentuate and make more definite a thought already existing.

community with the general doctrine of evolution is a belief in the modifiability of human nature through adaptation to conditions (which I held as a corollary from the theory of Lamarck) and a consequent belief in human progression. In the second and more important one, "Social Statics," published in 1850, the same general ideas are to be seen, worked out more elaborately in their ethical and political consequences. Only in an essay published in 1852, would the inquirer note, for the first time, a passing reference to the increase of heterogeneity as a trait of development, and a first recognition of this trait as seen in other orders of phenomena than those displayed by individual organisms. Onwards through essays published in several following years, he would observe further extensions in the alleged range of this law; until, in 1855, in the "Principles of Psychology," it begins to take an important position, joined with the additional law of integration, afterwards to be similarly extended. Not until 1857, in two essays then published, would he find a statement, relatively crude in form, of the Law of Evolution, set forth as holding throughout all orders of phenomena, and, joined with it, the statement of certain universal physical principles which necessitate its universality. And only in 1861 would he come to an expression of the law approximating in definiteness to that final one reached in 1867. All which facts the scientific reader who took the trouble to investigate would see are conclusive against the implication contained in Mr. Mozley's statement; since, were this implication true, my early writings would have contained traces of the specific doctrine set forth in the later ones. But, as I have said, even a reader of my books cannot be trusted to recall and consider these facts, but will certainly in many cases, and probably in most, passively accept the belief Mr. Mozley suggests.

Seeing this, I have felt it requisite definitely to raise the issue; and, for this purpose, have written to Mr. Mozley the following letter. It is made long by including a general outline of the Doctrine of Evolution, which it was needful to place before him that he might be in a position to answer my question definitely. Perhaps I may be excused for reproducing the letter in full, since ninety-nine out of a hundred do not know what the Doctrine of Evolution, in its wider sense, is, but suppose it to be simply another name for the doctrine of the origin of species by natural selection:—

"My dear Sir,—The passages from three letters of my father, sent herewith—one written in 1820, which was about the date referred to in your account of him, one written some thirteen years later, and the other twenty years later—will prove to you how erroneous is the statement you have made with regard to his religious beliefs. Having in this case clear proof of error,

you will, I think, be the better prepared to recognize the probability of error in the statements which you make concerning his philosophical ideas, and the ideas which, under his influence, you in early life elaborated for yourself.

"The passage in which you refer to these, gives the impression that they were akin to those views which are developed in the 'System of Synthetic Philosophy.' I am anxious to ascertain in what the alleged kinship consists. Some twelve years ago an American friend requested me, with a view to a certain use which he named, to furnish him with a succinct statement of the cardinal principles developed in the successive works I have published. The rough draft of this statement I have preserved; and that you may be enabled definitely to compare the propositions of that which you have called 'the younger philosophy,' with that which you have called 'the elder,' I copy it out. It runs as follows:—

"'1. Throughout the Universe, in general and in detail, there is an unceasing distribution of matter and motion. 2. This redistribution constitutes evolution where there is a predominant integration of matter and dissipation of motion, and constitutes dissolution where there is a predominant absorption of motion and disintegration of matter. 3. Evolution is simple when the process of integration, or the formation of a coherent aggregate, proceeds uncomplicated by other processes. 4. Evolution is compound when, along with this primary change from an incoherent to a coherent state, there go on secondary changes due to differences in the circumstances of the different parts of the aggregate. 5. These secondary changes constitute a transformation of the homogeneous into the heterogeneous—a transformation which, like the first, is exhibited in the Universe as a whole and in all (or nearly all) its details; in the aggregate of stars and nebulæ; in the planetary system; in the Earth as an inorganic mass; in each organism, vegetal or animal (Von Baer's law otherwise expressed); in the aggregate of organisms throughout geologic time; in the mind; in society; in all products of social activity. 6. The process of integration, acting locally as well as generally, combines with the process of differentiation to render this change not simply from homogeneity to heterogeneity, but from an indefinite homogeneity to a definite heterogeneity; and this trait of increasing definiteness, which accompanies the trait of increasing heterogeneity, is, like it, exhibited in the totality of things and in all its divisions and subdivisions down to the minutest. 7. Along with this redistribution of the matter composing any evolving aggregate, there goes on a redistribution of the retained motion of its components in relation to one another: this also becomes, step by step, more definitely heterogeneous. 8. In the absence of a homogeneity that is infinite and absolute, that redistribution of which evolution is one phase, is inevitable. The causes which necessitate it are these— 9. The instability of the homogeneous, which is consequent upon the different exposures of the different parts of any limited aggregate to incident forces. The transformations hence resulting are complicated by—10. The multiplication of effects. Every mass and part of a mass on which a force falls, subdivides and differentiates that force, which

thereupon proceeds to work a variety of changes; and each of thes becomes the parent of similarly-multiplying changes: the multiplic tion of them becoming greater in proportion as the aggregate becom more heterogeneous. And these two causes of increasing differenti tions are furthered by—11. Segregation, which is a process tendin ever to separate unlike units and to bring together like units—s serving continually to sharpen, or make definite, differentiations othe wise caused. 12. Equilibration is the final result of these transforma tions which an evolving aggregate undergoes. The changes go o until there is reached an equilibrium between the forces which al parts of the aggregate are exposed to and the forces these parts oppos to them. Equilibration may pass through a transition stage of bal anced motions (as in a planetary system) or of balanced functions (a in a living body) on the way to ultimate equilibrium; but the state c rest in inorganic bodies, or death in organic bodies, is the necessar limit of the changes constituting evolution. 13. Dissolution is th counter-change which sooner or later every evolved aggregate unde goes. Remaining exposed to surrounding forces that are unequilibriate each aggregate is ever liable to be dissipated by the increase, gradu or sudden, of its contained motion; and its dissipation, quickly unde gone by bodies lately animate, and slowly undergone by inanima masses, remains to be undergone at an indefinitely remote period b each planetary and stellar mass, which since an indefinitely dista period in the past has been slowly evolving: the cycle of its tran formations being thus completed. 14. This rhythm of evolution an dissolution, completing itself during short periods in small aggregate and in the vast aggregates distributed through space completing itse in periods which are immeasurable by human thought, is, so far as w can see, universal and eternal—each alternating phase of the proce predominating, now in this region of space and now in that, as loc conditions determine. 15. All these phenomena, from their gre features down to their minutest details, are necessary results of th persistence of force, under its forms of matter and motion. Give these as distributed through space, and their quantities being u changeable, either by increase or decrease, there inevitably result th continuous redistributions distinguishable as evolution and dissolutio as well as all those special traits above enumerated. 16. That whic persists, unchanging in quantity but ever changing in form, und these sensible appearances which the Universe presents to us, transcen human knowledge and conception—is an unknown and unknowab Power, which we are obliged to recognize as without limit in space an without beginning or end in time.'

"I am not aware that my father entertained any of thes views, either definitely or vaguely. But if he did, or if unde his influence you reached views similar to these or any of them it will, I presume, be possible to indicate the resemblances. O if specific resemblances are not alleged, still it will be possibl to point out what were the ideas you received from him whic potentially involved conclusions such as are above set forth.

"I fear I am entailing some trouble upon you in asking a

answer to this question, but the importance of the matter must be my apology. I am, my dear sir, faithfully yours,

"HERBERT SPENCER."

In Mr. Mozley's reply, he stated that he had been obliged already to send off his corrections for a second edition, adding that, "as therefore nothing can be done now, you would not care for any discussion." The result is that I remain without any reply to my question. One passage, however, in Mr. Mozley's letter, serves to give a widely different meaning to his statement; and, having obtained his permission, I here quote it as follows:—"You will observe that I have only a vague idea of my own 'philosophy,' and I cannot pretend to an accurate knowledge of yours. I spoke of a 'family likeness.' But what is that? There is a family likeness between Cardinal Newman's view and his brother Frank's."

Now, if the "family likeness" alleged is not greater than that between the belief of a Roman Catholic and the belief of a Rationalist who retains his theism, my chief objection is removed; for, just as the views of the brothers Newman have a certain kinship in virtue of the religious sentiment common to them, so Mr. Mozley's early views and my own have had the common trait of naturalistic interpretation—partially carried out in the one and completely in the other: a common trait, however, which would give Mr. Mozley's early views a "family likeness" to other philosophies than mine. This being understood, the only further objection to Mr. Mozley's statement which I have to make, is that I do not see how, even in this vague sense, a likeness can be alleged between that which he names and describes as "a *moral* philosophy" and "a system of philosophy" of which the greater part is concerned with the phenomena of Evolution at large—inorganic, organic, and super-organic—as interpreted on physical principles, and of which only the closing portion sets forth ethical conclusions as corollaries from all the conclusions that have preceded.

There remains only to answer the question—How could Mr. Mozley have been led to imagine a resemblance between things so different? He has himself gone far towards furnishing an explanation. In his introduction (p. 1) he admits, or rather asserts, that "reminiscences are very suspicious matter"; and that "the mental picture of events long passed by, and seen through an increasing breadth of many-tinted haze, is liable to be warped and coloured by more recent remembrances, and by impressions received from other quarters." He adds sundry illustrations of the extreme untrustworthiness of memory concerning the remote past; and in Chapter LXXXIII he characterises Denison's Reminiscences of Oriel College as "a jumble

of inaccuracies, absurdities, and apparent forgets." Moreover he indicates (p. 4) a special cause of distortion; saying of those "whose memory is subordinate to imagination and passion," that "they remember too easily, too quickly, and too much as they please." Now, as is implied by his religious ideas and ecclesiastical leanings, and as is also shown by a passage in which he refers to the scientific school with manifest aversion, Mr. Mozley is biassed towards an interpretation which tends to discredit this school, or a part of it; and obviously, to fancy a resemblance between scientific views now current, and those which he describes as a "dream" of his youth, which disappeared with his manhood, is not unsatisfactory to him. On looking through the "many-tinted haze" of sixty years at what he admits to be "a vague idea" of his early philosophy, he has unconsciously "warped and coloured" it, and imagined in it a resemblance which, as I have shown, it could not possibly have had.

I will only add that serious injustice is apt to be done by publication of reminiscences which concern others than the writer of them. Widely diffused as is Mr. Mozley's interesting work, his statement will be read and accepted by thousands who will never see this rectification.

HERBERT SPENCER.

The simplest and most conclusive disproof of Mr. Mozley's statement, however, is furnished by a letter which has since come to light, and is now in my possession, written by my father in January, 1860, to a favourite pupil of his, Mrs. (now Lady) White Cooper. The following passage from this letter shows that, so far from regarding my views as derived from him, he speaks of them in contrast with his own, and simply regards them with sympathetic tolerance.

"I quite agree with you that the feelings induced by the perusal of Herbert's essay entitled 'What Knowledge is of most Worth?' are somewhat depressing. Still I don't regret reading the essay, for such depression does not of necessity tend to harm. It may teach us humility; and he that humbleth himself shall be exalted—exalted in his faith. Even the just shall live by faith.

"From what I see of my son's mind, it appears to me that the laws of nature are to him what revealed religion is to us, and that any wilful infraction of those laws is to him as much a sin as to us is disbelief in what is revealed. And so long as he makes a holy use of his present knowledge, it is my privilege to believe that he will be led into all truth."

Thus it is manifest that certain naturalistic proclivities of thought my father displayed, were, by Mr. Mozley, confounded with a definite system of philosophy arrived at in pursuance of such naturalistic proclivities.

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